

RESOLUTION NO. 2018-134

RESOLUTION OF THE MAYOR AND THE CITY COUNCIL OF THE CITY OF HIALEAH, FLORIDA, AUTHORIZING THE MAYOR AND THE CITY CLERK, AS ATTESTING WITNESS, ON BEHALF OF THE CITY, TO EXECUTE THE FIRST AMENDMENT TO THE PROFESSIONAL SERVICES AGREEMENT BETWEEN HARRIS CORPORATION AND THE CITY OF HIALEAH, TO INCLUDE THE ACQUISITION, INSTALLATION AND IMPLEMENTATION OF ALL SERVICES, SOFTWARE, EQUIPMENT AND HARDWARE NECESSARY TO MODIFY THE P25 RADIO SYSTEM CONFIGURATION FROM A STANDALONE SYSTEM TO A MULTI-REGION SYSTEM THAT CONNECTS THE CITY OF HIALEAH SYSTEM WITH THE CITY OF MIAMI AND CITY OF MIAMI BEACH RADIO SYSTEMS, AND TO REMEDIATE GROUNDING DEFICIENCIES FOUND AT THREE CITY SITES, IN A TOTAL AMOUNT NOT TO EXCEED \$294,336.25, IN SUBSTANTIAL CONFORMITY WITH THE FIRST AMENDMENT ATTACHED HERETO AND INCORPORATED HEREIN AS EXHIBIT "1"; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, pursuant to Hialeah Resolution No. 2018-061 (June 26, 2018), the City Council waived competitive bidding, and approved a Professional Services Agreement between Harris Corporation and the City of Hialeah, with incorporated Software and End User License Agreements, to provide the City with a 800 MHz digital trunked simulcast network system, for a term of three years, with an option to renew for an additional two years, in a total amount not to exceed \$3,141,149.00;

WHEREAS, the Parties now desire to amend the Professional Services Agreement to modify the P25 radio system configuration from a standalone system to a multi-region system that connects the City of Hialeah system with the City of Miami and City of Miami Beach radio systems, to add a single additional microwave network connection between the City of Hialeah and the connected systems of the two neighboring cities, and to remediate grounding deficiencies found at Bucky Dent, City of Hialeah Fire Department, and City of Hialeah Police Department, under the same terms and conditions, as more particularly described in the First Amendment attached hereto and incorporated herein in substantial form as Exhibit "1", in a total amount not to exceed \$294,336.25; and

WHEREAS, the City Council finds that it is in the best interest of the public to enter into this First Amendment with Harris Corporation to provide enhanced interoperability between the City of Hialeah, City of Miami and City of Miami Beach, by expanding the coverage area for radio communications.


NOW, THEREFORE, BE IT RESOLVED BY THE MAYOR AND THE CITY COUNCIL OF THE CITY OF HIALEAH, FLORIDA, THAT:

Section 1: The foregoing facts and recitations contained in the preamble to this resolution are hereby incorporated and adopted by reference as if fully set forth herein.

Section 2: The City of Hialeah, Florida hereby authorizes the Mayor and the City Clerk, as attesting witness, on behalf of the City, to execute the First Amendment to the Professional Services Agreement between Harris Corporation and the City of Hialeah, to include the acquisition, installation and implementation of all services, software, equipment and hardware necessary to modify the P25 radio system configuration from a standalone system to a multi-region system that connects the City of Hialeah system with the City of Miami and City of Miami Beach radio systems, and to remediate grounding deficiencies found at three City sites, in a total amount not to exceed \$294,336.25, in substantial conformity with the First Amendment attached hereto and incorporated herein as Exhibit "1".

Section 3: This resolution shall become effective when approved by majority vote of the City Council and signed by the Mayor or at the next regularly scheduled City Council meeting, if the Mayor's signature is withheld or if the City Council overrides the Mayor's veto.

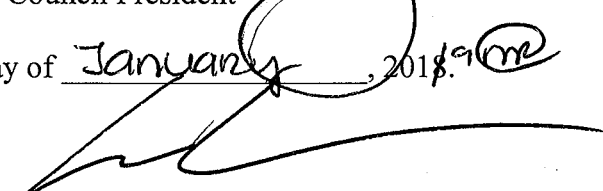
PASSED AND ADOPTED this 11 day of December, 2018.


Vian Casals-Munoz
Council President

Attest:

Approved on this 3 day of January, 2019.


Marbelys Fatjo, City Clerk


Mayor Carlos Hernandez

Approved as to legal sufficiency and as to form:


Lorena E. Bravo, City Attorney

Resolution was adopted by a 7-0 vote with Councilmembers, Zogby, Lozano, Casals-Munoz, Garcia-Martinez, Caragol, Cuenca, Hernandez, voting "Yes."



AMENDMENT NO. 1 TO PROFESSIONAL SERVICES AGREEMENT

THIS AMENDMENT NO. 1 ("Amendment") is made and entered into this ____ day of December, 2018 ("Effective Date"), by and between City of Hialeah, Florida ("City") and Harris Corporation acting through its Communication Systems Segment ("Contractor") (collectively, referred to as the "Parties").

RECITALS

WHEREAS, on or about June 27, 2018, the Parties entered into a Professional Services Agreement ("Agreement"), whereby the City purchased off the City of Miami's Request for Proposals No. 592382 for the procurement of an 800 MHz P25 Digital Trunked Simulcast Network System to upgrade and enhance two-way radio communications throughout the City;

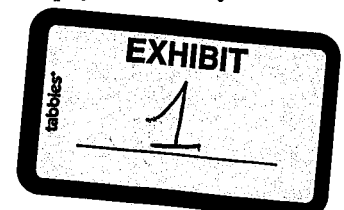
WHEREAS, the Parties now desire to amend the Agreement to modify the P25 radio system configuration from a standalone system to a multi-region system that connects the City of Hialeah system with the City of Miami and City of Miami Beach systems, and to add a single additional microwave network connection between the City of Hialeah and the connected systems of the two neighboring cities, as more particularly described in the Microwave Links and Core to Core Statement of Work, attached hereafter and incorporated to the Agreement as Exhibit "A-1"; and

WHEREAS, the Parties now desire to amend the Agreement to remediate grounding deficiencies found at Bucky Dent, City of Hialeah Fire Department, and City of Hialeah Police Department, as more particularly described in the Grounding Remediation Statement of Work, attached hereafter and incorporated to the Agreement as Exhibit "A-2".

NOW, THEREFORE, for and in consideration of the mutual promises of the parties to this Amendment and other good and valuable consideration, the receipt of which is hereby acknowledged, City and Contractor hereto do hereby agree as follows:

1. Recitals. The foregoing recitals are true and correct and are hereby incorporated by reference as if fully set forth herein.
2. Defined Terms. Except as otherwise expressly defined herein, all capitalized terms used in this Amendment shall have the same meanings given to such terms in the Agreement.
3. SECTION 5. SCOPE OF SERVICES, SUBSECTION A, is hereby deleted in its entirety and replaced by the following:

A. Contractor agrees to provide the Services as specifically described in, and subject to the special terms and conditions set forth in Exhibit "A", "A-1" and "A-2". Contractor represents and warrants to the City that: (i) it possesses all qualifications, licenses, authorizations, and expertise required under the Solicitation Documents for the performance of the Services, including but not limited to full qualification to do business in Florida; (ii) it is not delinquent in the payment of any



sums due the City, including payment of permit fees, business tax receipts, occupational licenses, accounts or invoices, nor in the performance of any obligations or payment of any monies to the City; (iii) all personnel assigned to perform the Services are and shall be, at all times during the term hereof, fully qualified and trained to perform the tasks assigned to each; (iv) the Services will be performed in the manner described in Exhibit "A", "A-1" and "A-2"; and (v) each person executing this Agreement on behalf of Contractor has been duly authorized to so execute the same and fully bind Contractor as a party to this Agreement.

4. SECTION 6. COMPENSATION, SUBSECTION A, is hereby deleted in its entirety and replaced by the following:

A. The amount of compensation payable by the City to the Contractor shall be based on the rates and schedules described in Exhibit "A", Section "11" and Section "11-A".

5. SECTION 7. PROGRESS PAYMENTS AND SCHEDULE, SUBSECTION C, is hereby deleted in its entirety and replaced by the following:

C. The City will pay, and the Contractor shall accept as full compensation for the Work, the sums specified in Exhibit "A", Section "11", Negotiated Price Sheet, and Section "11-A", Amendment Pricing Summary, as negotiated by the City. If City refuses to make payment of the full amount requested by Contractor, City must give Contractor prompt written notice stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount withheld. City shall promptly pay Contractor the amount withheld or any adjustment thereto agreed to when the reason for such action is remedied or otherwise negated.

6. SECTION 7. PROGRESS PAYMENTS AND SCHEDULE, SUBSECTION D, is hereby amended to add the Amendment Payment Schedule as item No. 3, which shall read as follows:

3) Infrastructure Hardware. First Amendment Payment Schedule		
1	Change Order: Due at Amendment Execution	35%
2	Infrastructure Hardware shipment and delivery	35%
3	Final System Acceptance	30%

7. The Microwave Links and Core to Core Statement of Work attached hereby and incorporated herein, is included as Exhibit "A-1" to the Agreement.
8. The Grounding Remediation Statement of Work, attached hereby and incorporated herein, is included as Exhibit "A-2" to the Agreement.



9. The Amendment Pricing Summary, attached hereby and incorporated herein, is included as Exhibit "A", Section "11-A" to the Agreement.
10. Any and all references in the Agreement to the "Total Agreement Price" shall also include the Amendment Price in the amount of \$294,336.25, for a Total Agreement Price in the amount of \$3,435,515.25.
11. Specific Terms and Conditions. The following terms and conditions are specific to this Amendment.
 - a. Contractor covenants and agrees that this Amendment includes all equipment and services necessary to integrate the City of Hialeah system with the City of Miami and City of Miami Beach systems. This includes all equipment and services necessary to design and implement a microwave network connection between the City of Hialeah and the connected systems of City of Miami and City of Miami Beach.
 - b. This Amendment includes a Factory Acceptance Test which will demonstrate the operation and additional capabilities of the three integrated systems.
 - c. The City understands that once the three systems leave the factory, the system cores must remain connected when powered on. If inter-system backhaul connections are not available when any of the cores are installed and powered on, temporary provisions will need to be made to collocate and connect the cores. Contractor will work with the cities to accommodate this requirement but any required additional space, power, and cooling will be the responsibility of the cities to provide.
 - d. Contractor covenants and agrees that the warranties and maintenance provisions included in Section 12 of the Agreement and the Master Services Agreement executed by the Parties on June 27, 2018, respectively, shall include any and all infrastructure hardware, services, software and equipment necessary to complete the work as described in this Amendment, at no additional cost to the City.
 - e. In the future, if the City desires to no longer be connected to the other systems, the server will need to be rebuilt as a standalone core. No additional equipment or software licenses will be required, but the cost for the services to perform this reconfiguration will be the responsibility of the City and a separate proposal for this change will be provided by the Contractor at that time.
 - f. The connection of multiple systems as described in this Amendment, and any future systems upgrades require coordination between the City of Hialeah, the City of Miami, and the City of Miami Beach. The City understands and agrees that the cities are responsible for said coordination and for the execution of any document in furtherance thereof.



12. Full Force and Effect. The terms and conditions of the Agreement, except as amended herein, shall remain in full force and effect. Any future reference to the "Agreement" shall be deemed to be a reference to the Agreement, as amended herein.
13. Execution. This instrument may be executed in one or more counterparts. Documents signed and transmitted electronically shall be deemed original and binding documents.

IN WITNESS WHEREOF, the Parties, through their duly authorized representatives, have executed this Amendment.

CITY OF HIALEAH

Attest:

Marbelys Fatjo, City Clerk
(SEAL)

Mayor Carlos Hernandez
_____ day of _____, 2018.

Approved as to form and legal sufficiency:

Lorena E. Bravo, City Attorney

CONTRACTOR

ATTEST:

HARRIS CORPORATION

Print Name: _____

By: _____
Print Name: Lori Rodriguez

Title: _____

Title: _____
(Authorized Corporate Representative)

(Corporate Seal)



EXHIBIT "A-1"

Microwave Links and Core to Core STATEMENT OF WORK

1. System Description
2. Implementation Plan
3. Schedule Impact/Integrated Factory Staging Schedule



CITY OF HIALEAH, FLORIDA

Regional Microwave Links and Core to Core

OCTOBER 2018

PROPRIETARY INFORMATION

Harris Corporation, through its Communication Systems segment (Harris Corporation), complies with all federal, state and local laws, ordinances, rules, and regulations regarding disclosure. However, Harris Corporation must still protect its trade secrets, intellectual property, and other confidential and competition sensitive business information. The enclosed proposal includes pricing, system design, trade secret and other confidential and competition sensitive information which is labeled as such in the proposal. Disclosure of any portion of this proposal shall be permitted only after the express written consent of Harris Corporation is provided. After award notification and upon official written request, Harris Corporation will disclose any proposal information that is no longer considered confidential or competition sensitive.



TECHNOLOGY TO CONNECT,
INFORM AND PROTECT™

System Description

Introduction

Harris is presenting a quote for the “core to core” integration of the City of Hialeah VIDA Network into a multicity architecture with the Miami and Miami Beach VIDA Networks, to obtain seamless interoperability with both cities.

Benefits of a Core to Core Integration

The core integration the two systems translates into the most powerful P25 interoperability between those two systems. For all operational purposes the users of those systems perceive them as one extended system.

Unlike interoperability achieve using ISSI gateways, Core to Core interoperability between systems is not limited by the Inter-RF Subsystem Interface standard, which only offers a subset of all the standard P25 features and does not allow for value adding Harris-specific features.

More specifically speaking, once an MOU is reached between the participating cities, the Core-to-Core connectivity will allow selected users from these cities to roam throughout the combined coverage area of the radio systems. This level of operation will allow Hialeah and partner Cities' users to maintain communications with their respective dispatcher and provide enhanced interoperability between the participating cities. In simpler words, users from Hialeah will be able to seamlessly communicate with users from Miami and/or Miami Beach during operations that require collaboration between multi-jurisdictional agencies in Miami, Miami Beach or Hialeah.

Summary of Equipment and Services

The core to core integration of the City of Hialeah VIDA Network into a multicity architecture with the Miami and Miami Beach VIDA Networks will require the following equipment and services, provided by Harris:

- Software reconfiguration of the VIDA Unite stand-alone network core to perform as a VIDA Connect network extension core.
- IP Network redesign for the integration of the City of Hialeah VIDA Network into a multicity architecture with the Miami and Miami Beach VIDA Networks.
- Microwave link connectivity with the City of Miami:
 - One 11 GHz hot standby (1+1) link between the City of Hialeah FD Headquarters and the City of Miami's Fire Station 3 Location.

Figure 1 is a high-level block diagram of the resulting multicity core to core integration.

Legend:

- 6 GHz Link
- 11 GHz Link
- 16 GHz Link
- 11 GHz Link - New Circuit

City of Hialeah:

- Hub: Hialeah FC
- Base Station 1: Hialeah FC
- Base Station 2: Hialeah FC
- Base Station 3: Hialeah FC

City of Miami:

- Hub: Dade County
- Base Station 1: Dade County
- Base Station 2: Dade County
- Base Station 3: Dade County
- Base Station 4: Dade County
- Base Station 5: Dade County
- Base Station 6: Dade County

City of Miami Beach:

- Hub: Beach FC
- Base Station 1: Beach FC
- Base Station 2: Beach FC
- Base Station 3: Beach FC
- Base Station 4: Beach FC

Three Cities Multiregional Architecture

Harris offers a multi-core/multiregional architecture by allowing the integration of multiple VIDA Connect cores to a central VIDA Premier core.

VIDA Connect provides a powerful solution for adding regions or local service areas to a system while improving communications resources availability of the area being served. P25 call traffic within a Connect region is routed locally while the parent VIDA Premier core provides administrative and management functions.

Trunked voice, console, and interoperability calls are all supported locally by Connect.

Like the VIDA Premier core; Connect regions include multiple levels of redundancy. The Connect server will be deployed in Location HA redundant configuration.

Distribution of Services between Central and Regional Cores

Figures 2, 3 and 4, below, show what technologies, subsystems and services are deployed directly at the local Connect level and which ones are centrally deployed, at the VIDA Premier level, and shared by the three Cities.

Figure 2. Central vs Local Service Deployment – 1 of 4

LMR Technologies / Interoperability Solutions	Central Deployment (Premier)	Local Deployment (Connect)
Project 25 Phases 1 and 2	Yes	Yes
NetworkFirst (Interoperability Gateway)	Yes	Yes

Figure 3. Central vs Local Service Deployment – 2 of 4

Real-Time Applications and Services	Central Deployment (Premier)	Local Deployment (Connect)
Network Switching Service (NSS)	Yes	Yes
StatusAware	Yes	No

Figure 4. Central vs Local Service Deployment – 3 of 4

Administration and Management Applications and Services	Central Deployment (Premier)	Local Deployment (Connect)
Unified Administration System (UAS)	Yes	No
Regional Site Manager (RSM)	Yes	Yes

Figure 5. Central vs Local Service Deployment – 4 of 4

Cybersecurity Services	Central Deployment (Premier)	Local Deployment (Connect)
Active Directory (AD)	Yes	No
Root Certificate Authority, including Subordinate Certificate Authority (CA)	Yes	No

Microwave Backhaul Connectivity

Harris is pleased to use Nokia as the microwave vendor for this project.

Microwave Specifications

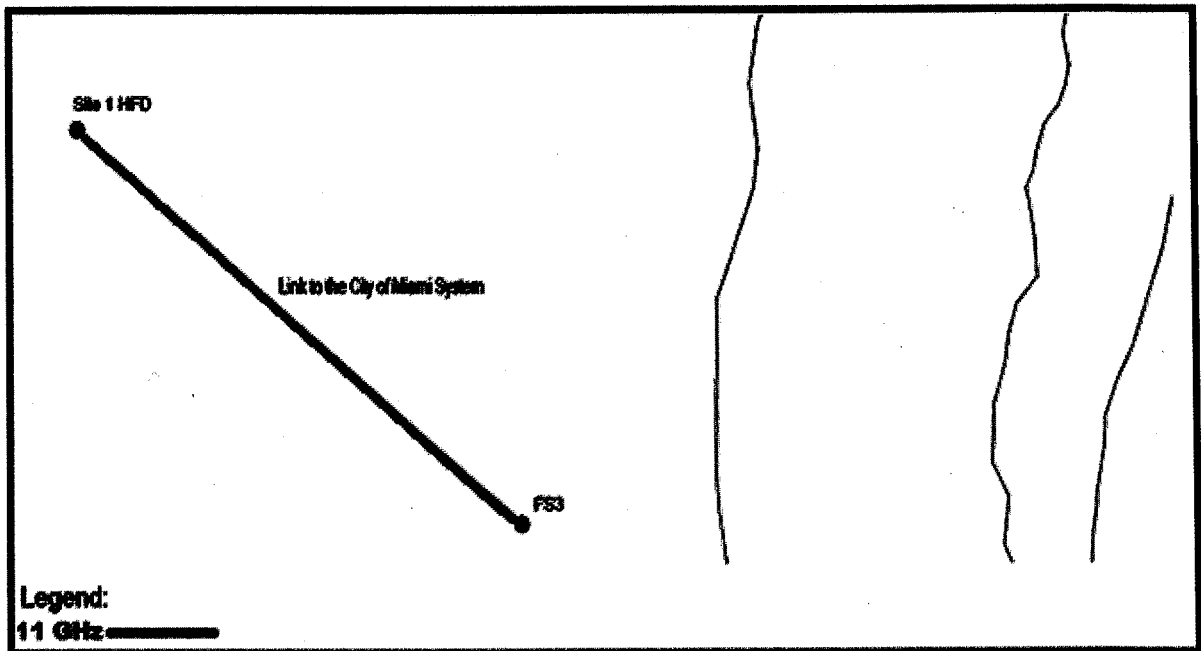
The following criteria were used for the microwave links:

- 100 Mbps per link
- 99.999% reliability per link
- Microwave spurs are monitored hot standby links (MHSB)
- Availability predictions
 - Requirement: 99.999% for 2-way annual using 10⁻⁶ BER
 - Flat fade margin 40 dB

Microwave Links Topology

1. One 11 GHz hot standby (1+1) link between the City of Hialeah FD Headquarters and the City of Miami's Fire Station 3 Location, to be provided by Nokia.

Figure 6. Microwave Links Topology



IMPLEMENTATION

Harris excels in the multifaceted implementation of mission critical radio systems to fulfill the specific needs of our customers and support their vital public safety operations. Harris will implement the scope of the proposed change order to extend the City of Hialeah's new Harris P25 VIDA Network into a multicity architecture with the City of Miami and City of Miami Beach VIDA Networks as described in the System Description. The process starts with the system design and culminates with acceptance of the change order scope as detailed in the System Description.

System Design

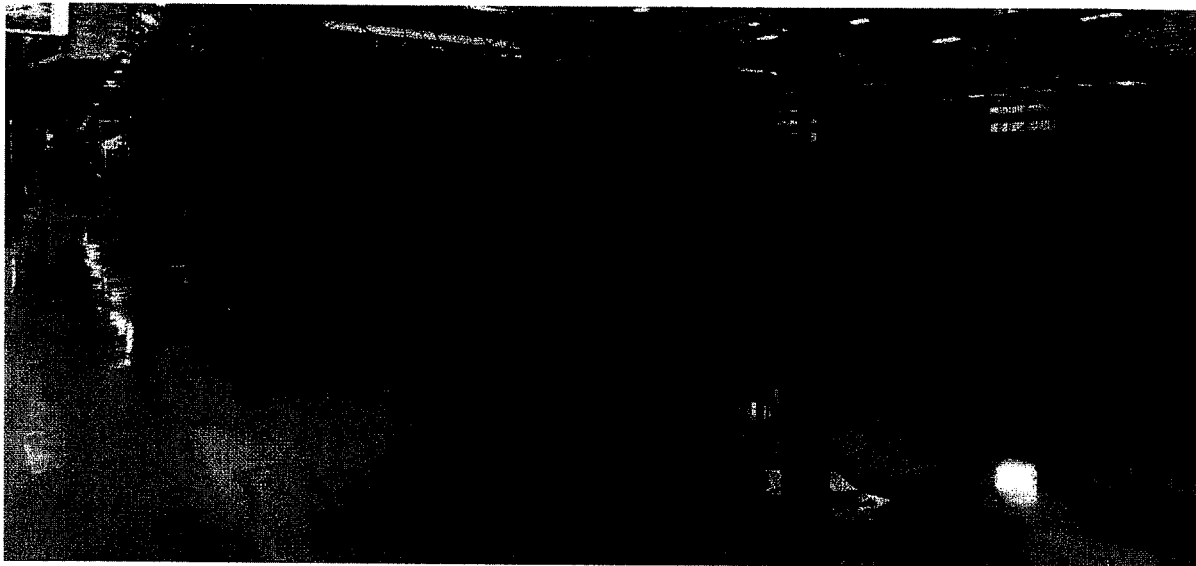
Customer Design Review (CDR)

The Harris Team uses the information obtained during site surveys, along with the regulatory and engineering documentation, to deliver the change order final system design at the CDR. The Harris Team presents design drawings and documentation during the CDR with the City of Hialeah.

Figure 1. Customer Design Review Responsibility Matrix

Tasks	Harris	City of Hialeah
Establish VPN connection to City of Miami (Any delay in the customer providing VPN access will result in excusable delays in Harris proceeding with the work)		X
Assemble project team and travel to the City of Hialeah's location	X	
Assemble customer team for kick-off meeting		X
Provide location of appropriate conference room or training facility		X
Present preliminary information on sites and design	X	
Provide information and status on sites, frequencies, bases, etc.		X
Provide site plans and applicable electrical and layout plans		X

Tasks	Harris	City of Hialeah
Provide site-specific tower and equipment drawings along with a detailed map of installation area and cabling		X
Perform structural analyses	X	
Develop required drawings	X	
Develop network plans and IP backhaul requirements	X	
Develop tower microwave antenna placement plans	X	
Develop preliminary cutover plan	X	
Develop formal project schedule	X	
Prepare acceptance test procedure (ATP) documents	X	
Prepare and submit FCC license applications for City of Hialeah's submission	X	
Arrange for site lease or lease modifications for any non-customer-owned sites		X
System block diagrams	X	
List of deliverable equipment for each site	X	
Network connection plan and backhaul requirements	X	
Tower microwave antenna placement drawings	X	
Antenna system drawings	X	
Backhaul system drawings	X	
ATP	X	
Project schedule	X	
Provide deliverables for review	X	
Review documents		X
Approve the design following CDR meeting (within 5 business days)		X



Factory Acceptance Test

System Integration and Test - *Factory Staging*

Harris will reconfigure the City of Hialeah Unite Core to a Connect Core and test the configuration through a customer provided VPN access to the City of Miami Unite Core, as well testing intercity system system connectivity to the City of Miami Beach system through customer-provided VPN access. The microwave vendors will perform a factory acceptance test of their equipment prior to shipping for installation at the sites identified in the System Description.

Figure 2. Shipping & Inventory Responsibility Matrix

Tasks	Harris	City of Hialeah
Provide VPN access and demarcation points at City of Miami Unite Core and City of Miami Beach Connect Core locations		X
Microwave vendors will factory test the microwave equipment	X	
Provide temporary storage near City of Hialeah's location and inventory equipment	X	
Sort equipment in preparation for site delivery and installation	X	

System Implementation

Site Development

Harris has not proposed any site development work as part of this change order. While not anticipated, if structural analyses of the three towers and the building rooftop location indicates structural modifications are required, Harris will identify those requirements to the City of Hialeah and quote any tower or building modifications that are needed.

General and Site Development Responsibility Matrices

The general responsibility matrix describes the general project responsibilities of both parties that are not associated with any specific site.

Figure 3. General Responsibility Matrix

Tasks	Harris	City of Hialeah
Coordinate with federal, state, and local government agencies, as required		X
Provide parking permits for Harris project team for any restricted parking areas		X
Arrange for temporary parking to off-load equipment at all buildings and sites		X
Comply with FCC OET65 Signage requirements (https://www.fcc.gov/general/oet-bulletins-line)		X

The site responsibility matrices below define the responsibilities of both parties for the implementation of the P25 Project.

Figure 4. Existing Customer-Owned Sites Responsibility Matrix

Tasks	Harris	City of Hialeah
Obtain any necessary zoning approval for site changes		X
Perform physical parameters for each microwave path	X	
Provide existing site plans		X
Provide current tower and foundation drawings along with a current mapping of installed antennas and cabling		X

Tasks	Harris	City of Hialeah
Identify specific tower/building attachment points to mount new microwave antennas per the system design	X	
Confirm availability of tower/building attachment points for microwave antennas		X
Perform structural analysis on existing tower, and provide results at 60K ft-lb tower cable load analysis. Harris can provide clients to strengthen tower (if possible), replace the tower, or provide site preparation services	X	
Strengthen or replace tower (if required by structural analysis results)		X
Provide space on existing tower/building to mount new microwave antennas at Harris specified locations		X
Ensure adequate space is available on cable ice bridge, and tower cable ladders, to support new cable runs		X
Install new microwave dishes, on pipe mounts with anti-sway kits	X	
Install new microwave waveguide or coaxial feed lines, secure to cable ladder(s), and add grounding kits at the top, bottom, and on ice bridge	X	
Tag and identify each new antenna line	X	
Provide floor/rack space in existing RF shelter for new equipment racks used in the new design		X
Provide adequate shelter equipment room utility /50 electrical power, single point ground system HVAC, and telecom generator power		X
Ensure existing entrance ports are available for microwave waveguide		X

Figure 5. Existing Collocation Sites Responsibility Matrix

Tasks	Harris	City of Hialeah
Arrange for access to third party collocated site		X
Negotiate and obtain space for modify existing lease for third party collocation site, ensuring the site lease includes required space on the tower, cable ice bridge, and tower cable ladders to support new cable runs, space in compartment for new shelter, generator, and fuel tank	X	X
Arrange with third party site owner to perform tower analysis	X	
Perform physical path surveys for each microwave path	X	
Provide existing site plans		X
Provide current tower and foundation drawings, from site owner, along with a current mapping of installed antennas and cabling		X

Tasks	Harris	City of Hialeah
Verify tower location, height, and other details for system design	X	
Confirm availability of tower attachment points for microwave antennas		X
Perform structural analysis of existing tower, and provide results of CDR to tower less than analysis. Tower can provide details to strengthen tower if possible, and/or the tower is replaced with a new tower	X	
Strengthen or replace tower (if required by structural analysis results)		X
Provide space on existing tower to mount new microwave antennas at Harris specified locations (defined in table below)		X
Ensure adequate space is available on cable ice bridge, and tower cable ladders, to support new cable runs		X
Install new microwave dishes on pole towers with anti-theft caps	X	
Install new microwave waveguide or coaxial feed lines, secure to cable ladder(s), and add grounding kits at the top, bottom, and on ice bridge	X	
Tag and identify each new antenna site	X	

Functional Acceptance Test

Acceptance Testing

The microwave vendor will test the new microwave link connecting the City of Hialeah with the City of Miami, to ensure they meet the specifications identified in the System Description.

Harris will test the connection of the City of Hialeah VIDA Network into a multicity architecture with the City of Miami and City of Miami Beach VIDA Networks to ensure it provides the functionality described in the System Description.

Final Change Order Scope Acceptance

Harris will submit initial system acceptance documentation for City of Hialeah to sign, marking the successful conclusion of acceptance testing and completion of the Change Order scope of work. Upon the completion of acceptance test, cutover, and submission of the final drawing package, the project manager submits the final change order acceptance letter for City of Hialeah to sign. With the final acceptance, the project manager arranges a meeting with the field service team to review maintenance support during the warranty period. The Harris Team provides the contact information and procedures used to obtain service during the warranty period.

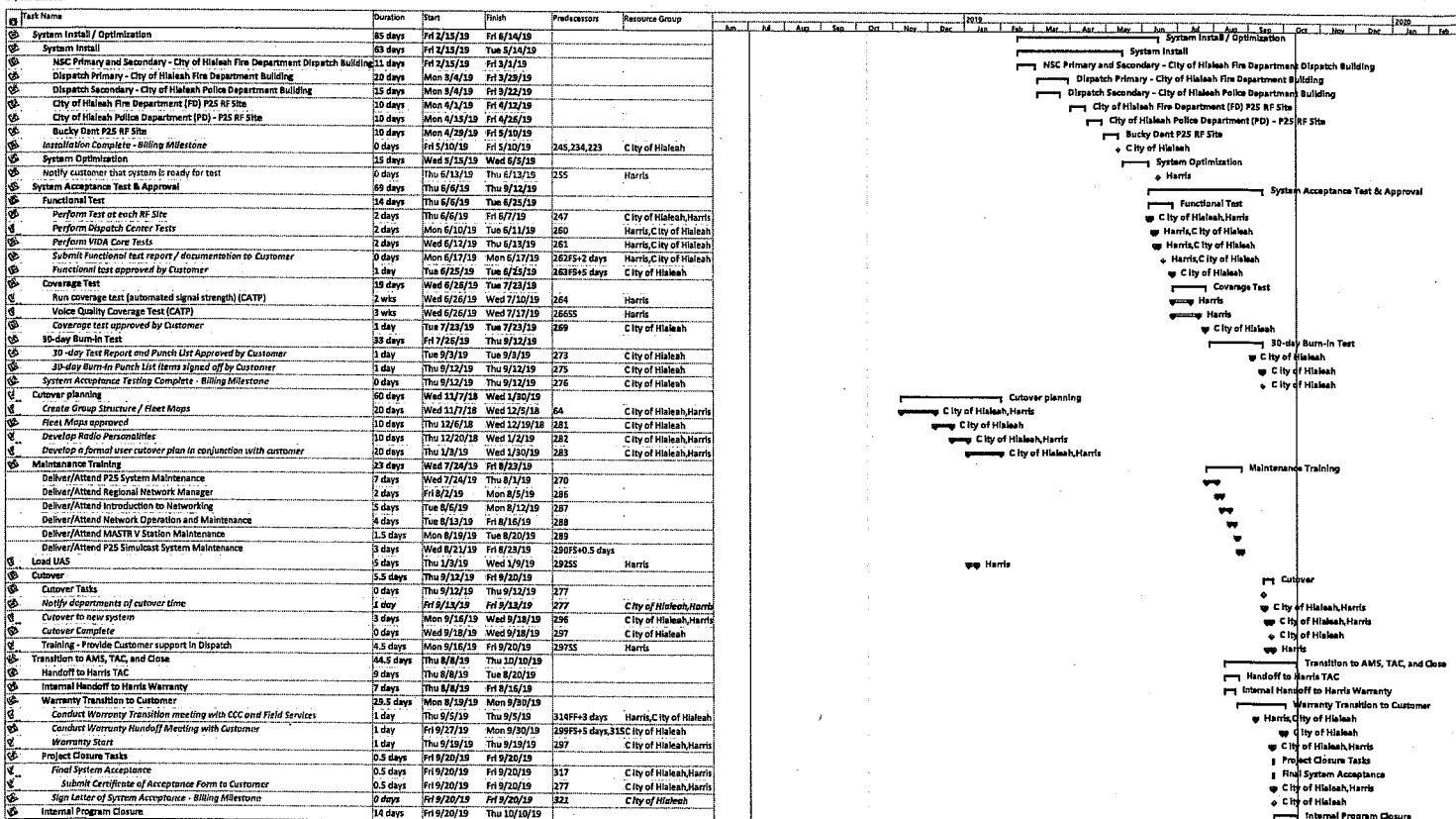
Figure 6. Final Change Order Scope Acceptance Responsibility Matrix

Tasks	Harris	City of Hialeah
Submit final drawing package	X	
Provide warranty and contact information	X	
Meet with Harris to outline system support and services requirements		X
Sign letter of final system acceptance (within 5 business days)		X

2018																			2019												2020											
Task Name	Duration	Start	Finish	Predecessors	Resource Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb											
Program Work Flow	327.5 days	Mon 7/2/18	Thu 10/10/19																																							
Contract Signed - Billing Milestone	0 days	Mon 7/2/18	Mon 7/2/18		City of Hialeah																																					
Program Start Up	11 days	Tue 7/17/18	Tue 7/31/18		City of Hialeah																																					
Customer Kick-Off / Preliminary Design Review	10 days	Tue 7/17/18	Mon 7/30/18		City of Hialeah, Harris																																					
Conduct Customer Kick-Off Meeting - Review As-Contracted Design	2 days	Fri 7/20/18	Mon 7/23/18	18,17	City of Hialeah, Harris																																					
Conduct Site Surveys including groundwork with Customer	3 days	Tue 7/24/18	Thu 7/26/18	19	City of Hialeah, Harris																																					
Site Surveys Complete	0 days	Thu 7/26/18	Thu 7/26/18	20	City of Hialeah, Harris																																					
Final Design Approval	279 days	Mon 7/2/18	Thu 8/1/19																																							
Final Design Review (FDR)	30 days	Mon 7/2/18	Mon 8/13/18																																							
Final Design Review (FDR)	5 days	Tue 7/24/18	Mon 7/30/18	19	Harris, City of Hialeah																																					
FCC - License Submission	0 days	Fri 8/3/18	Fri 8/3/18	36	City of Hialeah																																					
FCC-License Approvals Received	0 days	Mon 9/17/18	Mon 9/17/18	42FS+45 edays	City of Hialeah																																					
Customer Critical Design Review (CDR / DDR)	33 days	Thu 8/9/18	Tue 9/25/18																																							
Conduct Customer Design Review Meeting	1 day	Wed 9/19/18	Wed 9/19/18	31,45	City of Hialeah, Harris																																					
CDR Approved by Customer - Billing Milestone	0 days	Wed 9/19/18	Wed 9/19/18	47	City of Hialeah																																					
Post CDR Design Activities	40 days	Mon 9/24/18	Fri 11/16/18																																							
30-Day Performance Test Procedures Approved by Customer	1 day	Thu 10/4/18	Thu 10/4/18	51FS+5 days	City of Hialeah																																					
Complete Permit Applications	20 days	Mon 9/24/18	Fri 10/19/18	47FS+2 days	City of Hialeah																																					
Customer tasks/permits completed	20 days	Mon 10/22/18	Fri 11/16/18	53,49	City of Hialeah																																					
Training	213 days	Thu 10/4/18	Thu 8/1/19																																							
System Administrator(s) Identified by Customer	1 day	Thu 10/4/18	Thu 10/4/18	49FS+10 days	City of Hialeah																																					
Customer Approves Training Schedule provided by Harris	1 day	Thu 10/4/18	Thu 10/4/18	57S5	City of Hialeah																																					
Customer Identifies and Approves Training Location(s)	1 day	Thu 10/4/18	Thu 10/4/18	57S5	City of Hialeah																																					
System Manager Training	197 days	Thu 10/25/18	Thu 8/1/19																																							
Deliver/Attend P2S System Overview Course (Five 4-hour virtual classroom)	10 days	Thu 10/25/18	Thu 10/25/18	57FS+15 days	City of Hialeah, Harris																																					
Deliver/Attend Unified Administration System Course (Three 4-hour virtual)	0 days	Thu 11/1/18	Thu 11/1/18	61FS+5 days	City of Hialeah, Harris																																					
Deliver/Attend Regional Network Manager Course (Two 4-hour virtual class)	0 days	Thu 11/1/18	Thu 11/1/18	62	City of Hialeah, Harris																																					
Deliver/Attend P2S Rostering Workshop (On-site)	3 days	Fri 11/2/18	Tue 11/6/18	63	City of Hialeah, Harris																																					
Deliver/Attend Console Configuration Training (On-site)	2 days	Tue 11/13/18	Wed 11/13/18	207	City of Hialeah, Harris																																					
Deliver/Attend Console Configuration Training (Six 4-hour sessions on-)	3 days	Tue 7/30/19	Thu 8/1/19	272S5	City of Hialeah, Harris																																					
System Production	153.5 days	Thu 9/20/18	Wed 4/24/19																																							
System Production	29.5 days	Thu 9/20/18	Wed 10/31/18																																							
Place Orders	5 days	Thu 9/20/18	Wed 9/26/18																																							
Manufacturing	18 days	Fri 9/21/18	Wed 10/17/18																																							
Customer task in preparation for Harris equipment installation	153.5 days	Thu 9/20/18	Wed 4/24/19																																							
Core to Core microwave links	112.5 days	Fri 11/16/18	Wed 4/24/19																																							
Complete Microwave Path Surveys & Path Design	0 days	Thu 12/6/18	Thu 12/6/18	95FS+2 wks	Harris																																					
Customer tasks/permits completed	30 days	Mon 11/19/18	Mon 12/31/18	92																																						
City of Miami Beach Parkway Point lease modifications or building manager	30 days	Mon 11/19/18	Mon 12/31/18	92	Harris																																					
Microwave Factory Staging	3.5 days	Wed 8/20/19	Mon 3/25/19																																							
Hardware Factory Staging - Billing Milestone	0 days	Mon 3/25/19	Mon 3/25/19	307																																						
System Infrastructure Shipment and Delivery Acceptance - Billing Milestone	2.5 days	Mon 3/11/19	Thu 4/4/19	310																																						
Microwave System Install	99 days	Mon 11/19/18	Fri 4/5/19																																							
Any Required Customer Site Civil upgrades complete (Structural Modification)	0 days	Fri 11/16/18	Tue 3/19/19	32																																						
Microwave Acceptance Test Approved by Customer	1 day	Tue 4/23/19	Wed 4/24/19	132																																						
Factory Staging	25 days	Mon 12/17/18	Fri 1/18/19																																							
Infrastructure Hardware Factory Staging - Billing Milestone	0 days	Thu 2/7/19	Thu 2/7/19	145	City of Hialeah																																					
System Inspection and Pre-Ship	16 days	Mon 1/21/19	Mon 2/11/19																																							
Conduct Customer FAT (FAT/CPAT) 1/22	5 days	Mon 1/28/19	Fri 2/1/19	142,141	City of Hialeah, Harris																																					
Customer FAT Approved	1 day	Thu 2/7/19	Thu 2/7/19	144	City of Hialeah																																					
System Infrastructure Shipment and Delivery Acceptance - Billing Milestone	0 days	Fri 2/15/19	Fri 2/15/19	146FS+5 days	City of Hialeah																																					
Site Civil Construction	84 days	Mon 8/27/18	Mon 12/24/18																																							
Plans, Permits, and Approvals	62 days	Mon 8/27/18	Wed 11/21/18																																							
Approvals	5 days	Thu 10/18/18	Wed 10/24/18	155,157																																						
Vendor Supplied Equipment	40 days	Thu 9/27/18	Wed 11/21/18																																							
Receive all 3rd Party supplied materials	8 wks	Thu 9/27/18	Wed 11/21/18	72,49	Harris																																					
City of Hialeah Fire Department (FD) Tower Site Civils	6 days	Fri 11/23/18	Fri 11/30/18																																							
City of Hialeah Police Department (PD) Tower Site Civils	9 days	Mon 12/3/18	Thu 12/13/18																																							
Bucky Dent RF Site	7 days	Fri 12/14/18	Mon 12/24/18																																							
All Customer Site Civil upgrades complete	1 day	Thu 12/27/18	Thu 12/27/18	184	City of Hialeah																																					

Regional Milestones table and Gantt chart
City of Hialeah, Florida

Project Schedule



Pricing Summary

Harris is pleased to provide the City of Hialeah, Florida, with the following firm fixed price proposal. This offer is based upon the terms and conditions are pursuant to the Professional Service Agreement by and between the City of Hialeah and Harris executed on June 27, 2018.

Microwave Link Nokia (to Miami)			
One 11 GHz hot standby (1+1) link between the City of Hialeah FD Headquarters and the City of Miami's Fire Station 3 Location.	\$153,548.75	1	\$153,548.75
Subtotal			\$153,548.75
Core to Core Implementation Services			
	\$44,700.00	1	\$44,700.00
Subtotal			\$44,700.00
Options Below the Line			
One 6 GHz hot standby (1+1) link between the City of Hialeah PD Headquarters and the City of Miami Beach Parkview Point location.	\$175,361.25	1	\$175,361.25
Services for conversion to standalone after being deployed as part of multi-region	\$190,560.00	1	\$190,560.00

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Subtotal			\$153,548.75
Core to Core Implementation Services			
	\$44,700.00	1	\$44,700.00
Subtotal			\$44,700.00
Grounding Remediation			
Bucky Dent Grounding Remediation	\$38,162.50	1	\$38,162.50
Hialeah Fire Headquarters Grounding Remediation	\$27,012.50	1	\$27,012.50
Hialeah Police Headquarters Grounding Remediation	\$30,912.50	1	\$30,912.50
Subtotal			\$96,087.50
Options Below the Line			
One 6 GHz hot standby (1+1) link between the City of Hialeah PD Headquarters and the City of Miami Beach Parkview Point location.	\$175,361.25	1	\$175,361.25
Services for conversion to standalone after being deployed as part of multi-region	\$190,560.00	1	\$190,560.00



EXHIBIT "A-2"
Grounding Remediation
STATEMENT OF WORK

1. Grounding Audit Report
2. Responsibility Matrix

		1(22)
		Document number
Prepared by		Revision
Patsy Cannon – Grounding Engineer, Harris Corporation PSPC		A
Contents responsible if other than preparer		Date
Approved by		September 15, 2018
		Remarks
		City of Hialeah, FL Grounding Audit conducted 9/10/18

Executive Summary:

The City of Hialeah, FL is located in the most active lightning area in the U.S. By design, RF tower sites are the tallest object in the area. With a new radio system being installed in the City of Hialeah's existing sites, three RF tower sites were evaluated for any necessary grounding/lightning protection upgrades given that the city has experienced lightning damage to their current equipment on multiple occasions.

No single "smoking gun" was identified. Instead, my analysis is that there are several potential contributing factors to the damage, the most important of which is the tower grounding. The suggested improvements for the currently installed equipment are organized by location and prioritized by urgency and ease of implementation.

I would recommend that the grounding improvements be made per Harris Corporation's Site Grounding and Lightning Protection Guidelines AE/LZT 123 4618/1, Rev. F.

Grounding and Surge Protection Best Practices:

The City of Hialeah sites house various types of equipment as is common for most modern public safety radio systems. My concentration was on the tower sites, RF equipment rooms, and dispatch centers. I observed varying levels of grounding and surge protection on equipment located in the various locations. The most important grounding and surge protection best practices in protecting equipment at a location are:

- 1) Maintaining low inductance tower grounding – The tower leg ground connections should provide the lowest inductance path to ground if a lightning event occurs. These connections need to be installed properly and checked periodically.

Lowering the inductance of the tower grounding is the most critical item to be addressed at all 3 sites. This includes adding a tower lightning rod to the top of the 2 towers where they do not exist currently.

- 2) Single point grounding – All of the equipment in a site should be bonded to a single point ground to eliminate differing ground potentials that may result from multi-point grounding.

The Bucky Den site shelter lacks a single point ground with a low inductance path outside to a buried ground system.

- 3) Surge protection – It is very important that the AC utility power and all incoming copper lines have proper surge protection installed that is bonded to the single point ground.

At all 3 sites, some of the incoming copper telco and alarm lines coming into the shelters/equipment rooms do not have surge protection installed and grounded properly.

Detailed Observations and Recommendations:**Items are prioritized by urgency and ease of implementation:**

- █ = Item should be remedied immediately.
- █ = Item that would greatly improve the situation.
- █ = Item that would improve the situation, but not required.
- █ = Item that is not ideal and would provide minor improvement to situation, but not required.
- █ = Item that should be considered when the new Harris equipment is installed.

Towers at All Three Locations:

1. █ Audits were conducted at three sites: Fire Department, Police Department, and Bucky Den. Each site has a 200 ft self-supporting tower. These self-supporting towers have PiRod tower legs. Each leg consists of 3 separate circular solid bar stock components with lattice along the length for strength as shown in Figure 1. This differs from more typical self-supporting towers whose leg construction consists of a single circular solid or hollow metal cylinder as shown in Figure 2.

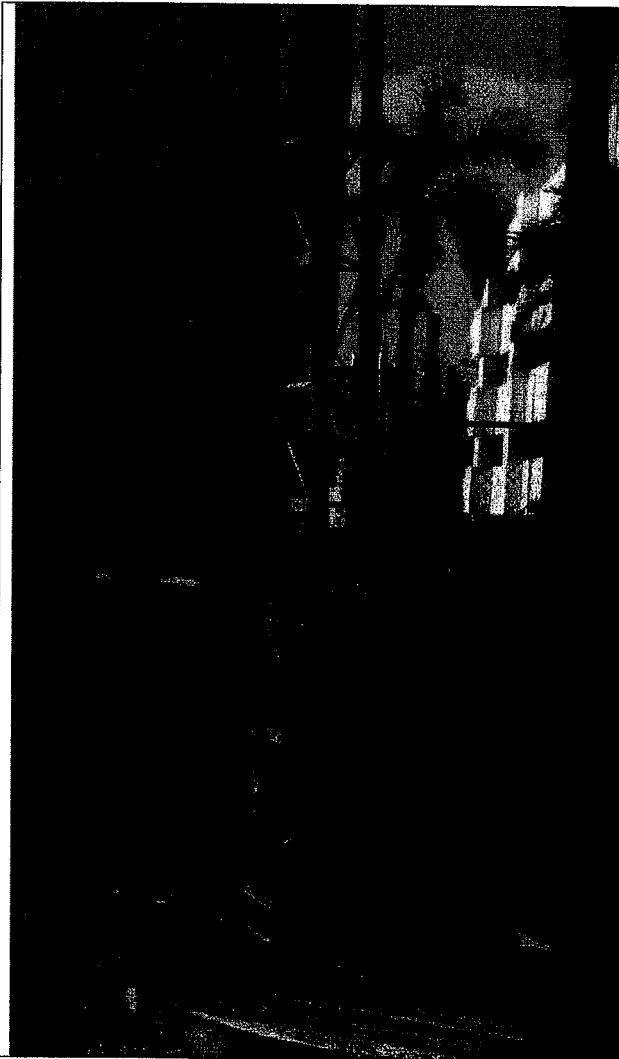


Figure 1 – Antenna tower PiRod leg at Fire Department site

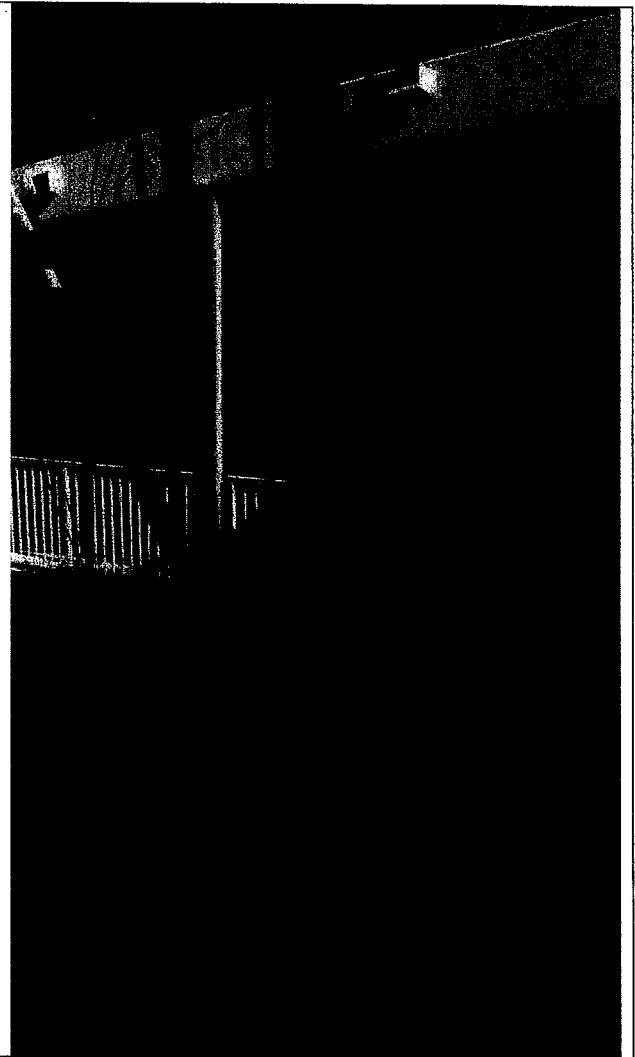


Figure 2 – More typical antenna tower leg on second tower at Police Department site

One of the primary protection elements for an RF tower site is to dissipate the surge current from a lightning strike to the tower then into the buried ground ring to minimize the amount of surge current that must be dealt with inside the equipment room/shelter. The PiRod tower legs on the City of Hialeah tower sites present 3 paths/leg for lightning surge current to travel toward ground.

Currently, only 1 of these 3 paths has a ground conductor to the buried tower ground ring. Adding a separate ground conductor to each of the 3 leg components going to its own ground rod along the buried tower ground ring will lower the inductance of the tower ground path thus reducing the amount of surge current that will go toward the equipment.

Adding 2 ground rods and connections from the tower legs to the existing ground ring would cost more in labor to hand dig, than to replace the tower ground ring completely. Buried ground systems corrode over time like any buried metal. Replacing the buried tower ground rings at the 3 sites will provide additional years of effective protection for the tower sites. In addition, during the tower grounding evaluation at each site, a ground ring break was found at the Bucky Den site. (If the tower ground rings are not replaced, then repairing this break in the tower ground ring at Bucky Den is urgent.)

I would also recommend driving 20ft ground rods along the tower ground ring instead of the standard 10ft ground rods. Due to the small base diameter of the towers, I feel this would provide lightning surge currents a more attractive lower resistance ground system and a better path to dissipate away from the tower and equipment.

2. [REDACTED] Add lightning rods to the top of towers at Police Department and Bucky Den that extend above the height of any tower antennas. This helps protect the antennas from sustaining direct lightning strikes. Ensure that the lightning rod on the Fire Department tower is above the top of the highest antenna.
3. [REDACTED] Improving the tower ground bar installation will also reduce the amount of surge current present at the equipment room during a lightning strike. Given the high take-off point of the RF cables leaving the tower at the 3 sites, this is also a high priority upgrade to help protect the equipment.

A second #2 AWG solid tinned conductor should be added to the tower ground bar going directly to the tower ground ring. The current tower ground bar #2 AWG solid conductor should be moved away from the tower leg and go directly to the tower ground ring also. A ground conductor running parallel to another metal surface has more inductance.

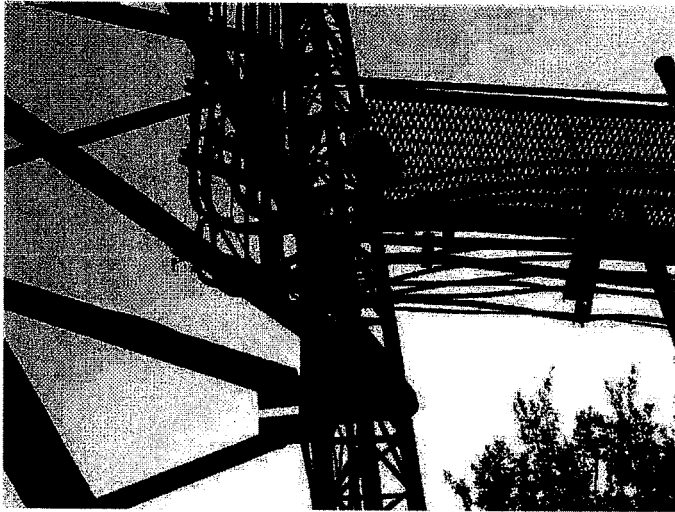


Figure 3 – Fire Department tower ground bar showing conductors routed down tower leg and minimal drip loops

4. [REDACTED] When the new RF transmission lines are installed, make an exaggerated drip loop where the cables exit the tower toward the shelter or equipment room. This adds inductance to this undesired surge current path so more surge current will flow off the RF transmission line shield toward ground on the lowest RF cable ground kit that attaches above the drip loop and has a low inductance path to ground through the tower ground bar.
5. [REDACTED] If the tower leg grounding is improved, install RF transmission line ground kits at least every 50 ft, with every 25 ft preferred. when the new RF transmission lines are installed. This provides a path for surge currents that couple onto the RF transmission lines to flow back onto the lower inductance path to ground of the tower. This reduces the amount of surge current that will flow on the RF transmission line shields to the RF entry to the equipment.
6. [REDACTED] There are several white RF enclosures of some type and surge protectors hanging on 2 of the towers that appear to be partially disconnected. If these are no longer in use, they should be removed from the tower along with their cables going into a shelter/equipment room.



Figure 4 – White RF enclosures and surge protectors on leg of tower at Fire Department

Shelters/Equipment Rooms at All Three Locations:

7. [REDACTED] Bond any existing Telco supplementary ground bar (SGB) directly to the single point ground, also known as the Master Ground Bar (MGB), with a #2 AWG or larger conductor to provide a low inductance path to ground. Cut the existing Telco SGB connection to the halo ground ring.

Ensure all telco grounds and surge protector grounds are bonded to the Telco SGB and not to the halo ground ring.

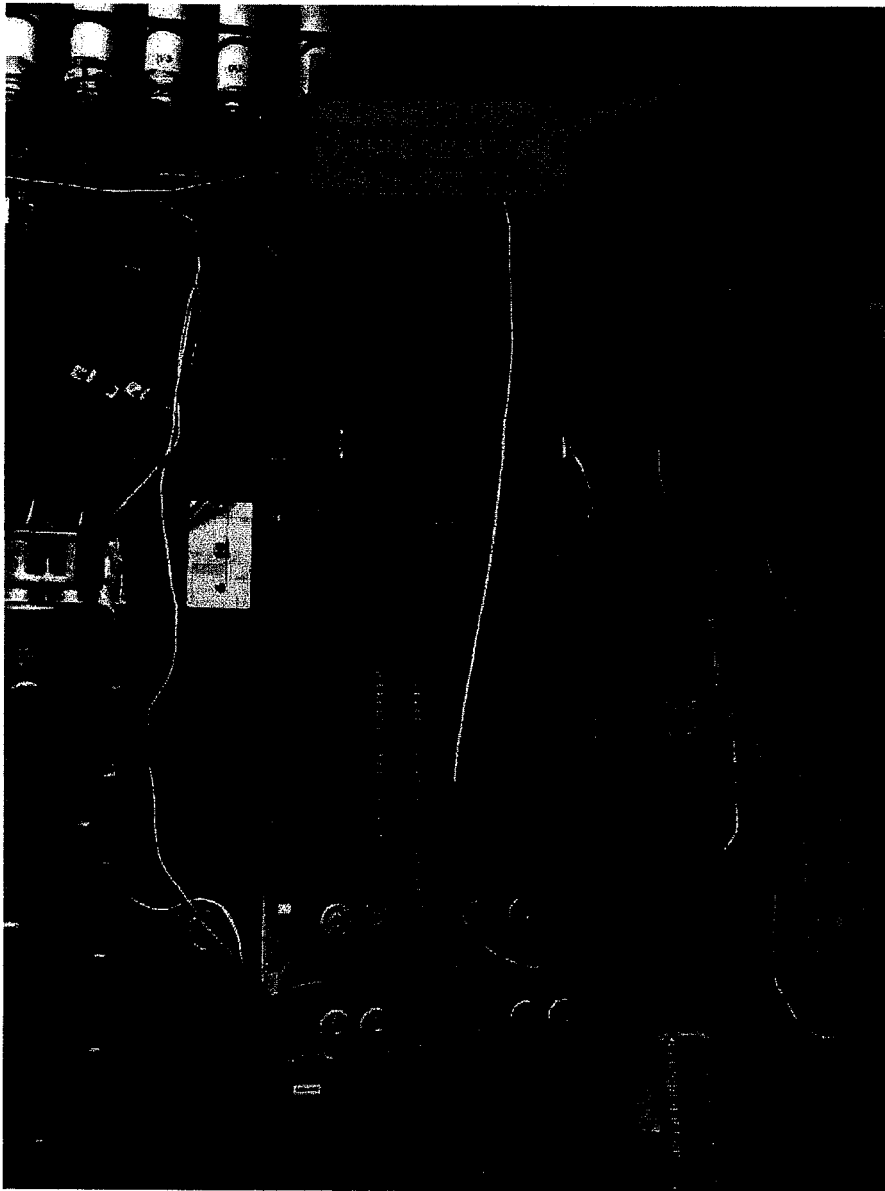


Figure 5 – Fire Department equipment room Telco supplementary ground bar (SGB) with connection to halo ground ring

8. [REDACTED] Ensure any incoming copper telco or alarm/control lines have proper surge protection with bonding to the Telco SGB or the MGB directly.



Figure 6 – Bucky Den incoming alarm punch block with properly installed surge protection and grounding

9. [REDACTED] Replace old AC utility power surge protectors (AC SPD) with new AC SPD's. The protection devices used in the AC SPD's have a lifetime and newer AC SPD's are available with lower let-through voltages that will provide more protection for the equipment.

If the AC SPD's are replaced, ensure that they are installed as effectively as possible to minimize let-through voltage. (See Section 6.4.6 of Harris Corporation's Site Grounding and Lightning Protection Guidelines AE/LZT 123 4618/1, Rev. F for details.)

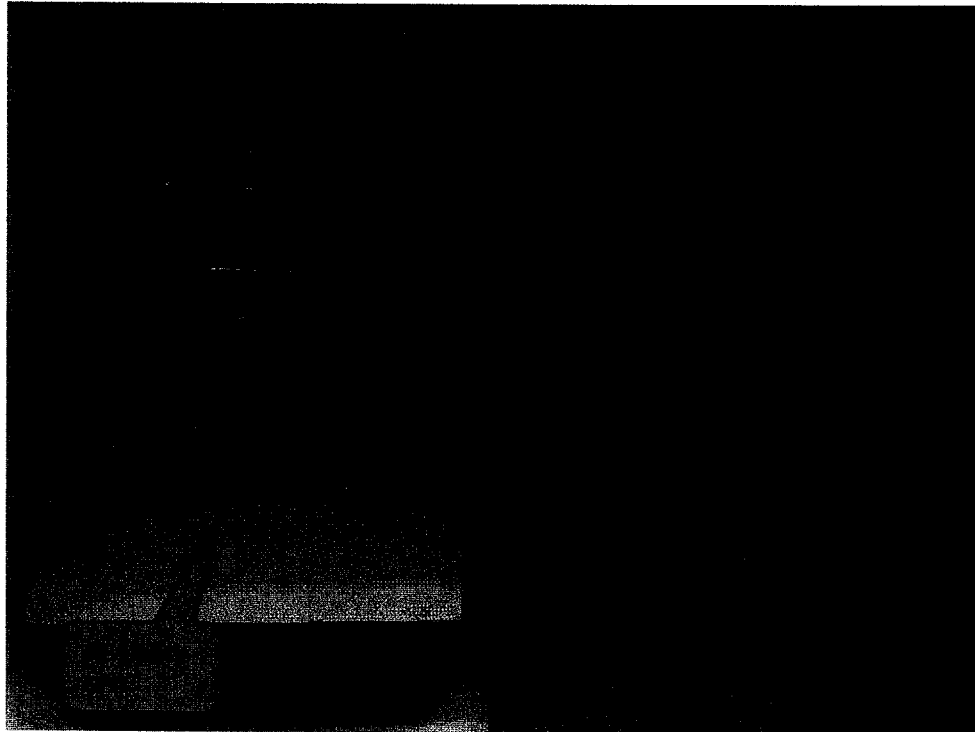


Figure 7 – Fire Department existing AC utility power surge protector (AC SPD) installed at breaker panel

6.4.6 Installation of Panel-Type AC Surge Suppression Devices

You should install panel-type AC power surge suppressors as close as possible to the service entrance breaker panel according to the manufacturer's recommendation. This point cannot be stressed enough. A general rule of thumb is that for each foot of wiring between the AC SPD and the breaker panel, the transient let-through voltage will increase by an additional 165 Volts.

During a surge the self-inductance of the wire connecting the SPD can also significantly increase the residual let-through voltage reaching the equipment being protected. The conductors should be kept as short as possible and twisted together to minimize their self-inductance. It is also important to have no sharp bends in the conductors to the SPD.

Conductors to the SPD should be sized as recommended by the manufacturer, but at least #6 AWG should be used. The SPD should be on its own 30A, or larger, breaker after the main breaker to allow for servicing.

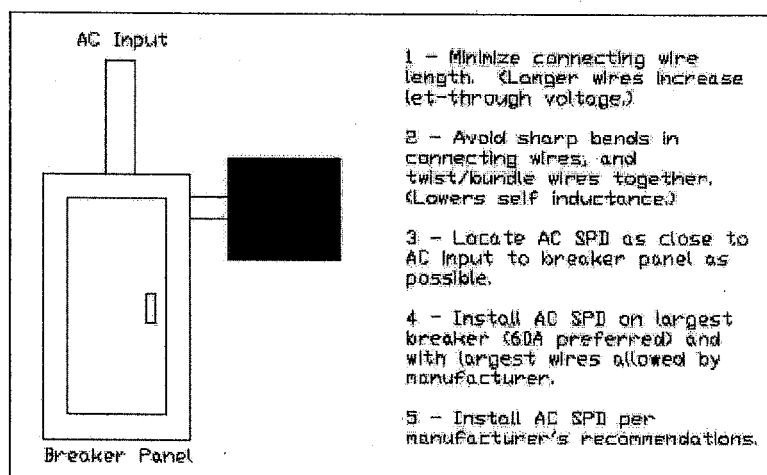


Figure 6-13: AC Surge Suppression Installation Detail

Figure 8 – Excerpt from Harris Corporation's Site Grounding and Lightning Protection Guidelines AE/LZT 123 4618/1, Rev. F section 6.4.6.

10. [REDACTED] Bond all new cabinets installed in shelter/equipment rooms to MGB #2 AWG home run with irreversible crimp connections, not split bolts that can loosen over time without proper maintenance.
11. [REDACTED] Make sure the cable ladder in all shelters/equipment rooms is bonded to the MGB with a single #2 AWG stranded green-jacketed conductor where it passes closest to the MGB. Any other connections to the halo ground should be removed.
12. [REDACTED] Ensure that the Alcatel microwave DC distribution system has a properly located and sized DC equalization conductor. Usually the DC equalization conductor is located on the DC return bus and runs directly to the MGB. The apparent DC equalization conductor at the City of Hialeah sites bonded to the DC power plant itself.

13. [REDACTED] Replace interop radio split bolt ground connections with irreversible crimp connections that cannot loosen over time without preventive maintenance.

Dispatch Centers at Fire Department and Police Department:

14. [REDACTED] Ensure that the dispatch position grounding wires are ultimately bonded back to equipment room MGB. Typically this is accomplished by installing an SGB in the dispatch room that is bonded back to the equipment room MGB with a #2 AWG or larger copper conductor. Grounds from the various dispatch positions are then bonded directly to the SGB or attached to a #2 AWG home run from the SGB that runs to different rows of equipment.

No ground connection between the equipment room and the dispatch center could be identified at either location, but when new consoles are installed this can be investigated more thoroughly.

Fire Department Site Specific:

15. [REDACTED] The second story RF entry port into the building at the Fire Department has four 6-inch copper straps running down the side of the building to provide a ground path for the RF entry and the equipment room MGB. The configuration of the straps is that there are two runs each with two copper straps which are sandwiched with a piece of plexiglass running their length.

The copper straps have been damaged over time, but due to the concrete sidewalk, this would be difficult to repair. Of more concern is the melted plexiglass on the left strap. The plexiglass isolates the two copper straps that make up a run. I recommend that the damaged plexiglass be replaced to maintain the isolation of the two copper straps to reduce inductance. Perhaps a vinyl cover could be installed over the straps to protect them from further damage also.



Figure 9 – Two runs of copper straps down side of Fire Department with intact/undamaged plexiglass

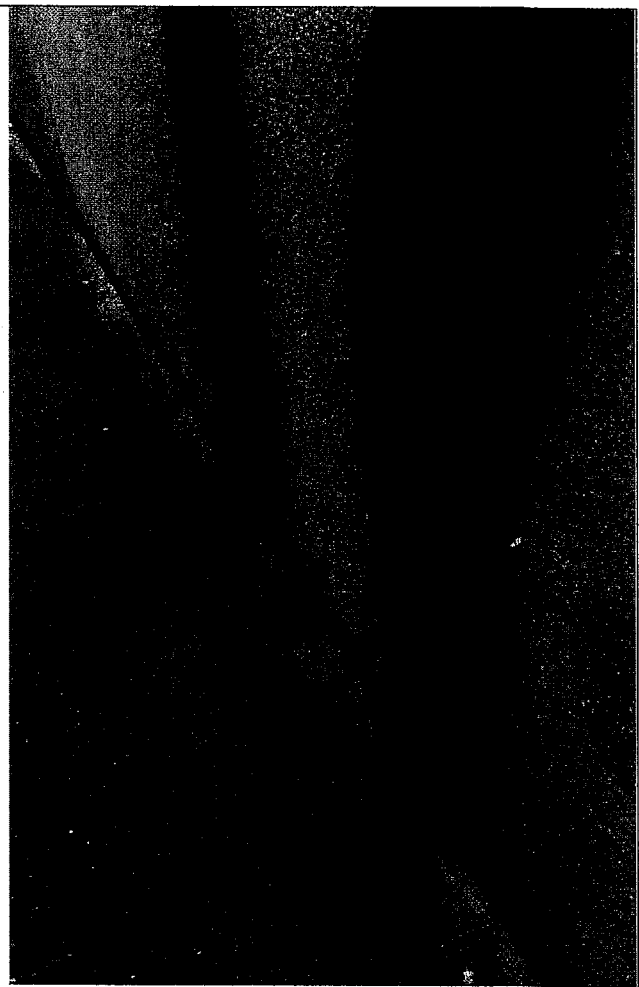


Figure 10 – Bottom of copper strap runs showing damaged/melted plexiglass on left strap.

16. [REDACTED] The second story RF entry port into the Fire Department building has an exterior ground bar with a single #2 AWG solid conductor that makes a sharp bend into the building then connects to the copper straps with a sandwich bar connection. This sharp bend increases the inductance of this important path to ground. In addition, it potentially brings surge current into the building before it connects to the copper straps for a path to ground.

This exterior ground bar is the path to ground for the final RF transmission line shield ground kits before the cables enter the building. I recommend that the single #2 AWG solid conductor be replaced with 2 #2 AWG conductors which each route straight down and bond with a sandwich bar connection to each copper strap run outside the building. This would greatly reduce the inductance of this important ground bar path to ground.

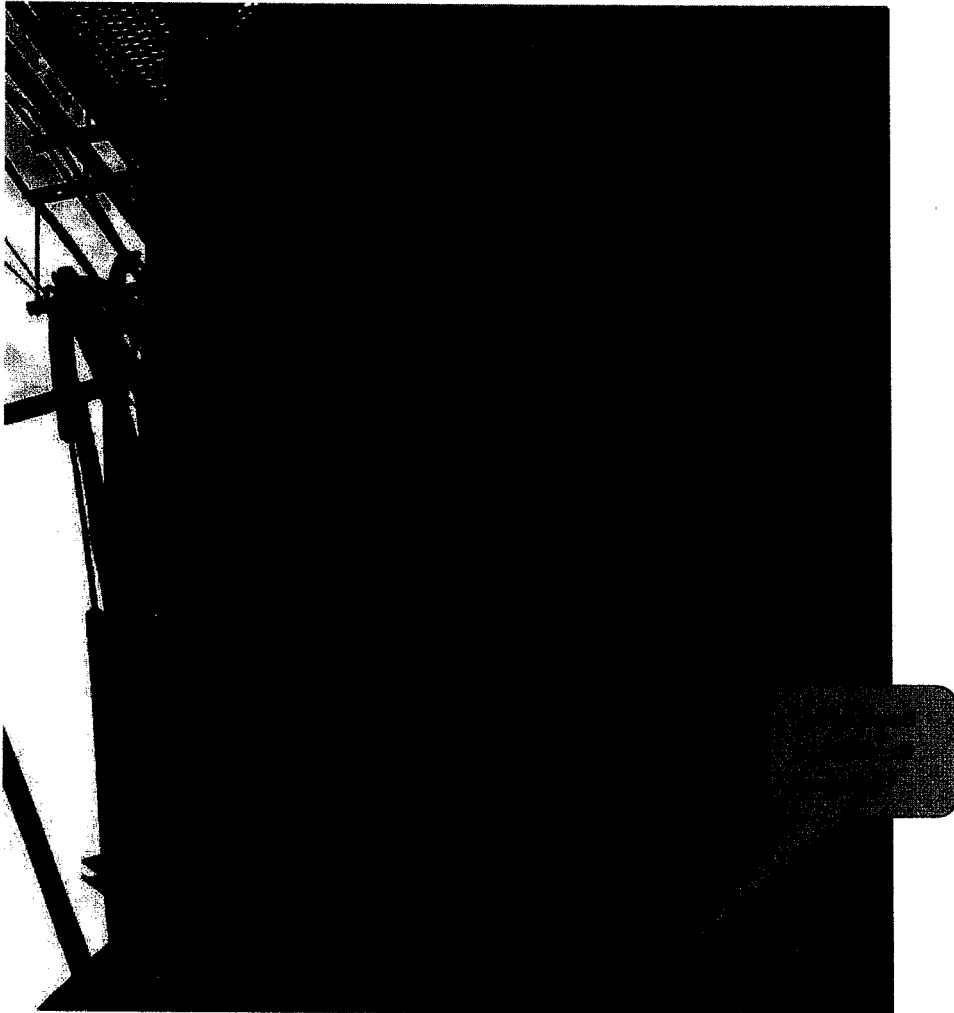


Figure 11 – Fire Department exterior ground bar underneath second story RF entry into building showing sharp bend of conductor

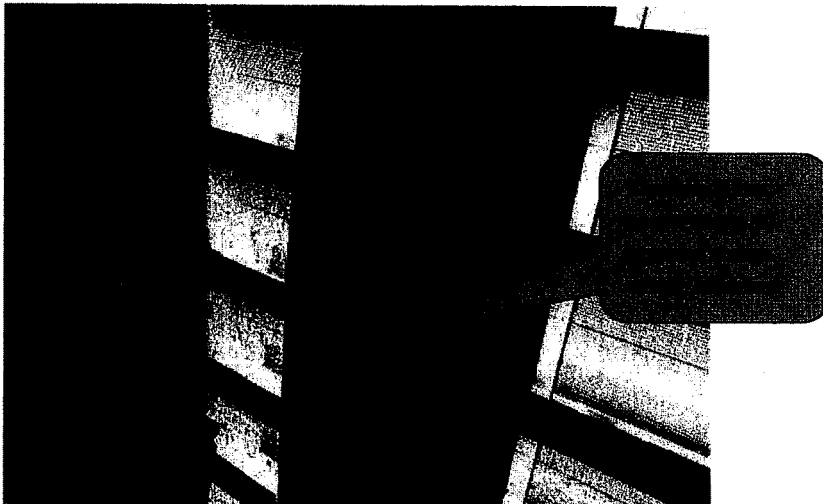


Figure 12 – Fire Department exterior ground bar connection to copper strap inside building with sandwich bar connection

17. [REDACTED] [REDACTED] Install the RF surge protectors (RF SPD's) for the new RF transmission lines at the RF entry directly on the interior sub-panel. This provides the RF SPD's a low inductance path to ground and avoids bringing these surge currents into the equipment room that has a higher inductance path to ground.



Figure 13 – Fire Department RF entry port interior sub-panel where all RF SPD's should be located

18. [REDACTED] Move the RF surge protectors (RF SPD's) for the interop radios that will stay long term from the equipment room 100ft into the building to the RF entry port interior sub-panel. This provides the RF SPD's a low inductance path to ground and avoids bringing these surge currents into the equipment room that has a higher inductance path to ground.
19. [REDACTED] Lower the inductance of the ground path from the RF entry port to the equipment room Master Ground Bar (MGB) located approximately 100 ft into the building by adding at least a #2/0 AWG jacketed conductor between the two locations.



Figure 14 – Fire Department equipment room MGB with current #2 AWG solid conductor to RF entry port and RF SPD's located in equipment room

20. [REDACTED] Add ground connections to incoming cable TV ground blocks. The ground connections should go either to the MGB or telco SGB directly or have a small new ground bar added that is bonded back to the MGB with a #2 AWG or larger conductor.

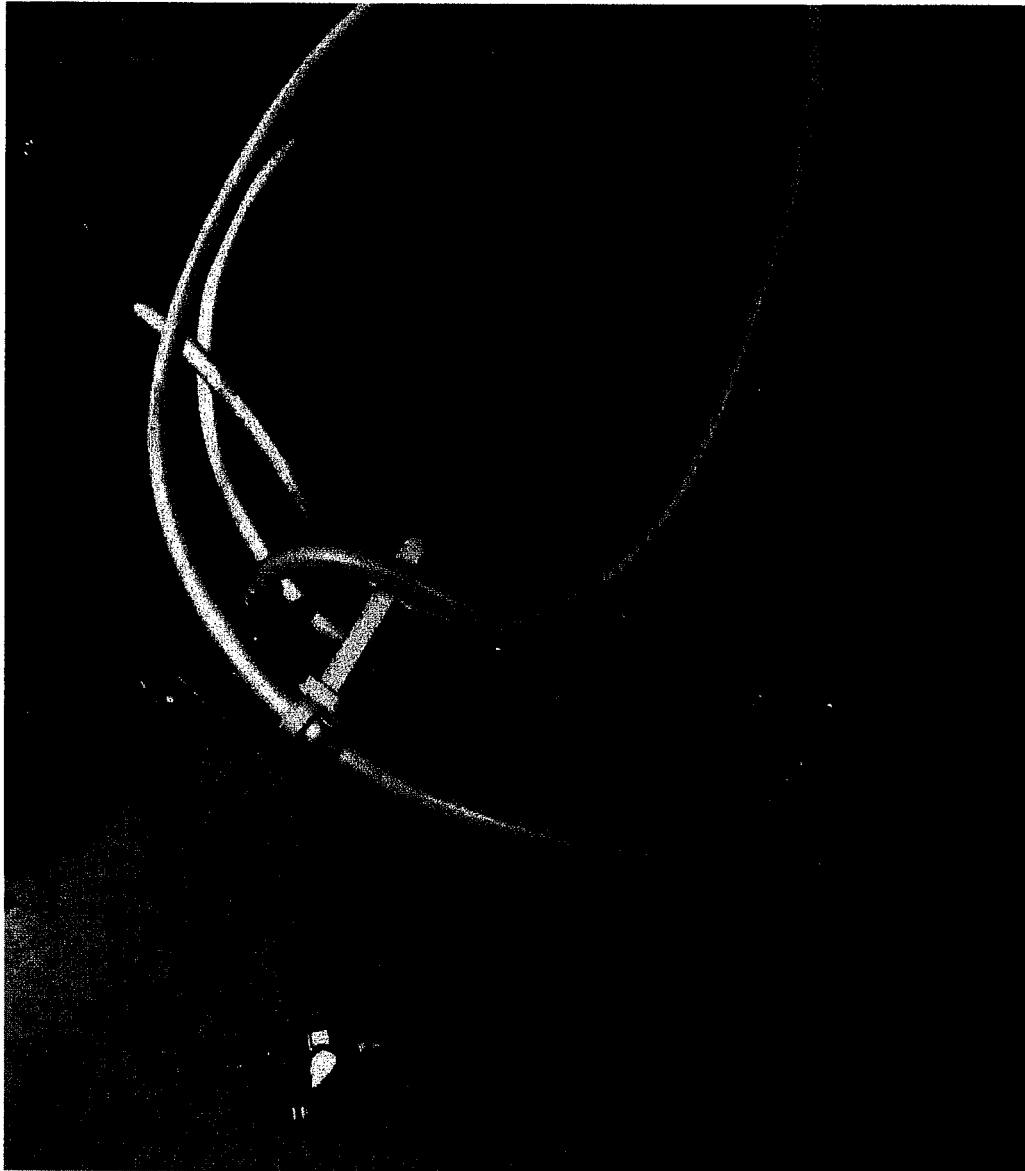


Figure 15 – Fire Department equipment room incoming cable TV connections with no grounds

Police Department Site Specific:

21. [REDACTED] Repair the broken bonding jumper on one side of the entry fence gate. This is a touch potential personnel safety issue.
22. [REDACTED] Inside the shelter, the generator control/alarm wires are not terminated and have no surge protection or grounding. This is direct path into the shelter for a lightning surge current.

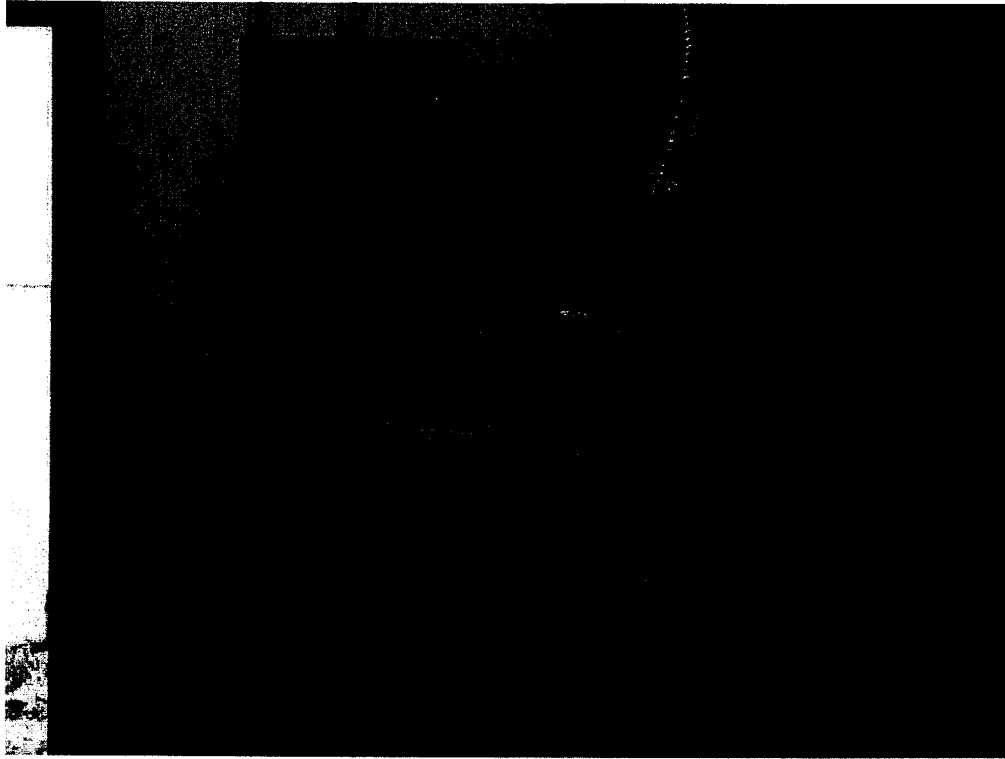


Figure 16 – Police Department shelter unterminated generator control/alarm wiring

23. [REDACTED] There is a second tower at the Police Department. Ensure that the two tower ground rings are bonded together underground, preferably with 2 separate connections.
24. [REDACTED] The ice bridge grating between the tower and the shelter should be bonded across sections and to the ice bridge posts. It currently has no bonding.
25. [REDACTED] Bond the housing of the air conditioning units on the outside of the shelter to the buried shelter ground ring.
26. [REDACTED] Inside the shelter, replace the #2 AWG solid connection to the MGB. The same conductor may be used with an irreversible crimp two-hole lug being added. If the conductor is not long enough, then a new conductor should be run from the MGB directly to the buried shelter ground ring.

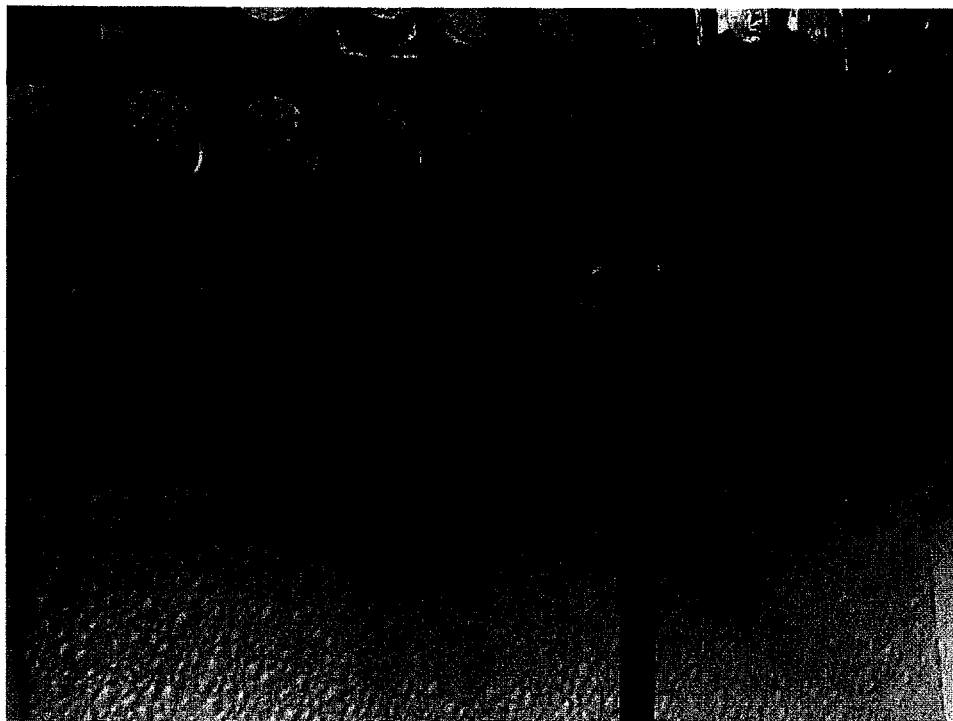


Figure 17 – Police Department shelter MGB poor exothermic weld connection to ground

27. [REDACTED] Install #2 AWG home run from MGB to second equipment row in cable ladder. There is no equipment grounding home run for the second row from the MGB currently. During audit, it was indicated that new cabinets would be installed in this row.
28. [REDACTED] Add AC power panel SPD inside shelter. There is not one in shelter currently. Even if the AC utility power comes from inside the Police Department building, it runs outside near the two towers to get to the shelter. This results in a high probability that a lightning surge current could couple onto the incoming AC power in the event of a tower lightning strike.

If an AC SPD is added, ensure that it is installed as effectively as possible to minimize let-through voltage. (See Section 6.4.6 of Harris Corporation's Site Grounding and Lightning Protection Guidelines AE/LZT 123 4618/1, Rev. F for details.)

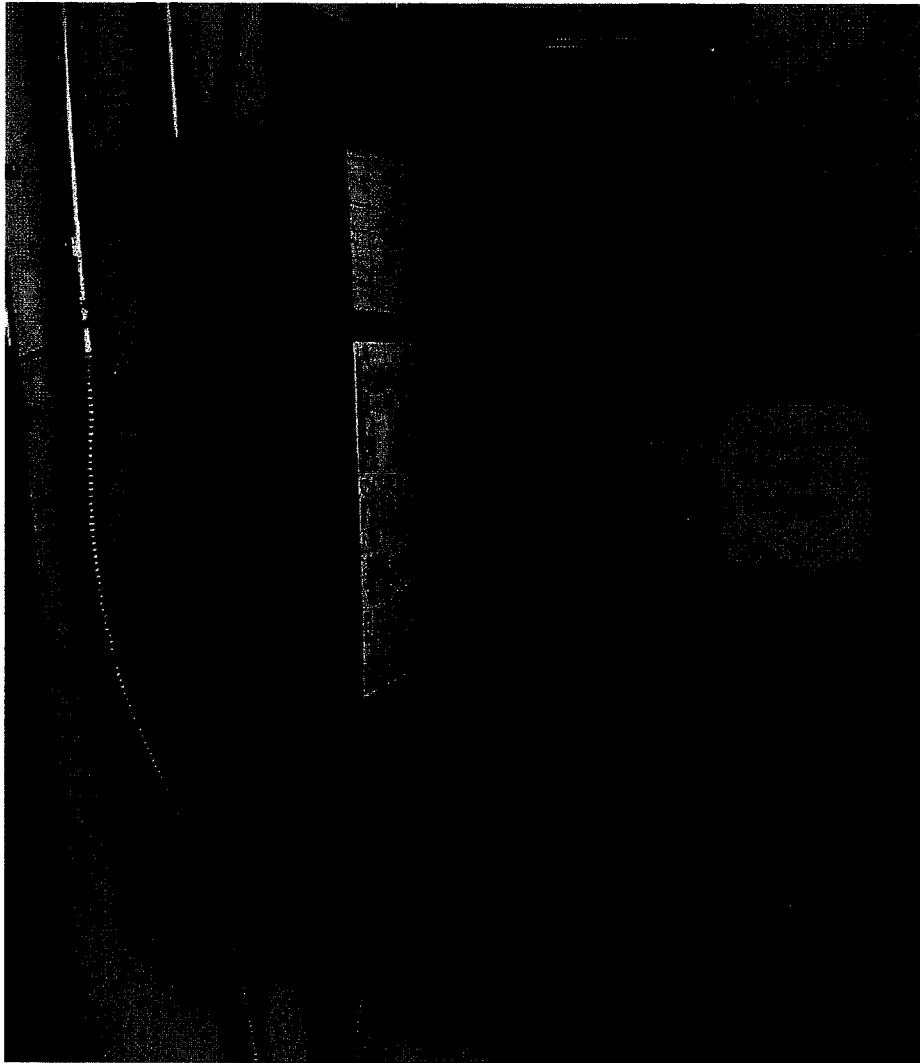


Figure 18 – Police Department shelter AC power breaker panel with no AC SPD

29. [REDACTED] Inside Police Department equipment room inside main building, add an additional #2 AWG stranded connection between the equipment room MGB and the RF entry port interior sub-panel. This is to reduce the inductance of the MGB connection to ground. (The RF entry port has 4 copper straps that go to ground outside on the other side of the wall.)

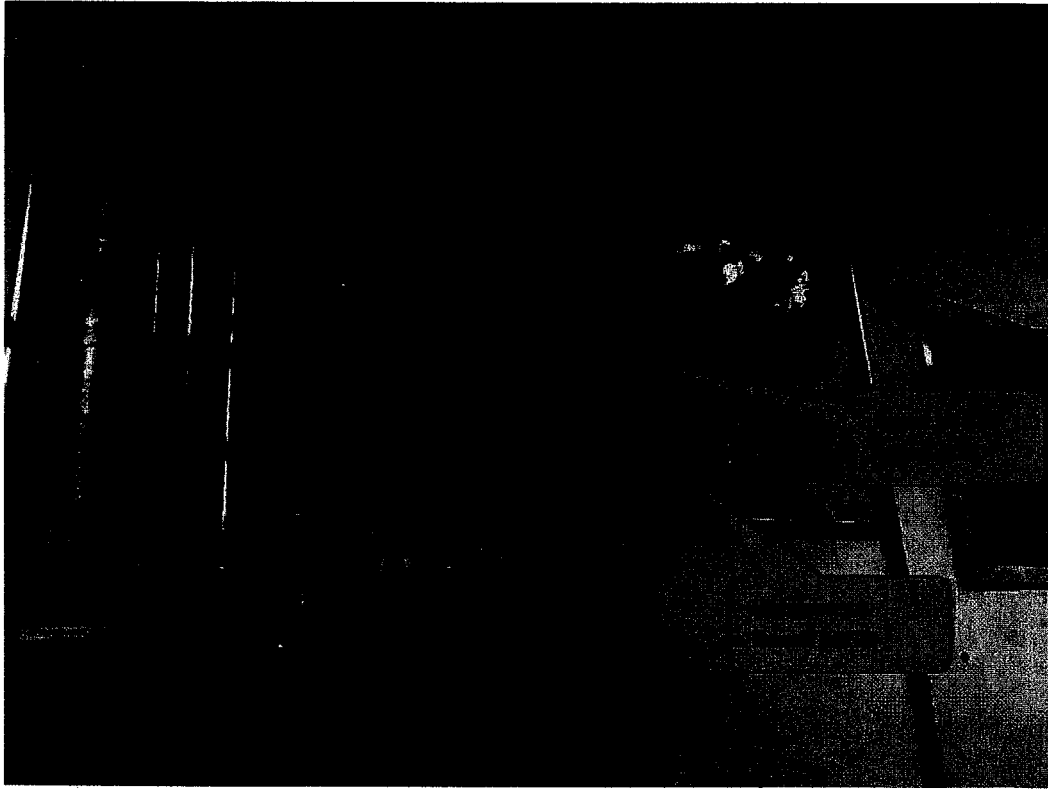


Figure 19 – Police Department equipment room MGB with single connection to RF entry port interior sub-panel

30. [REDACTED] Ensure there is not mold growing on the wall adjacent to the MGB wall to the right.

Bucky Den Site Specific:

31. [REDACTED] Remove conductor hanging off tower into tree beside generator.

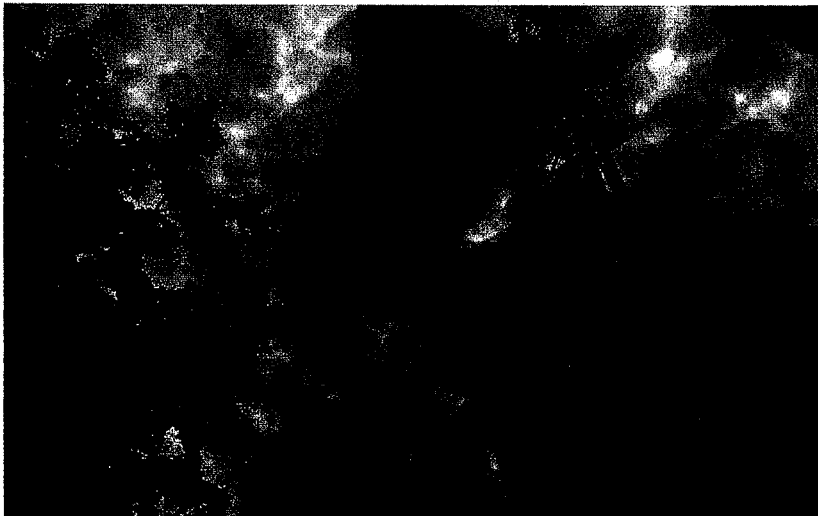


Figure 20 – Bucky Den tower with conductor hanging in tree

32. [REDACTED] Ensure that the elevated AC power transformer, AC utility power meter, and AC power neutral-ground bond located in the first disconnect are all bonded to one or more ground rods that are bonded to the shelter ground ring. Burn marks are still present from previous damage on the outside shelter wall where the AC utility meter is located.

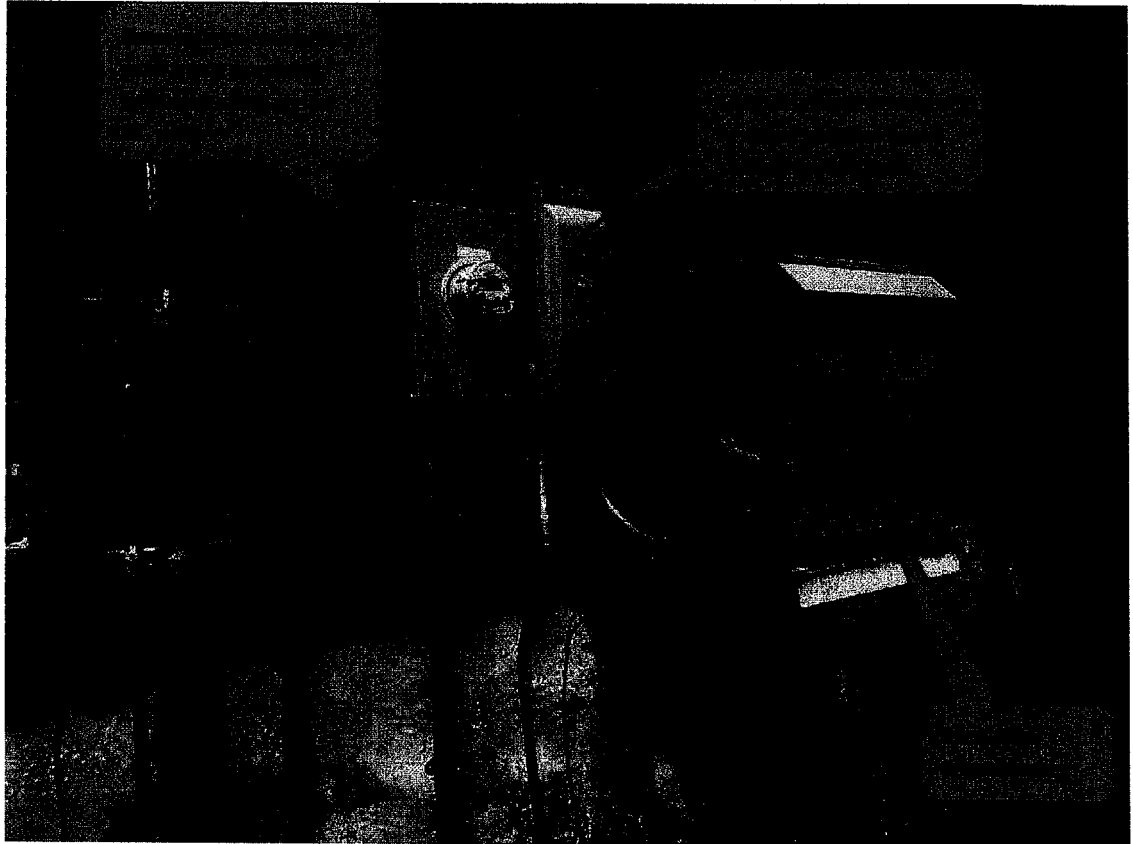


Figure 21 – Bucky Den shelter incoming AC utility power configuration

33. [REDACTED] Ensure there is no neutral-ground bond located in the generator.
34. [REDACTED] Add ground connection to the generator frame.
35. [REDACTED] Remove the two large trees growing inside the fenced compound. One is touching the tower, and the other is growing next to the generator.
36. [REDACTED] Ensure the shelter ground ring is bonded to the tower ground ring with at least 1 buried connection. Two connections are preferred for redundancy and to lower the inductance of the connection.
37. [REDACTED] Remove the 4 corner down runner connections from the interior shelter halo ground going to the buried exterior shelter ground ring.

When there is a lightning strike to the tower, there is a ground potential rise going away from the tower as the current dissipates. If the shelter has only a single connection to ground, then everything inside the shelter rises in potential together then falls together. There is no current

flow. When there are multiple connections to ground, there are differing potentials inside the shelter, so there is current flow to equalize the potential.

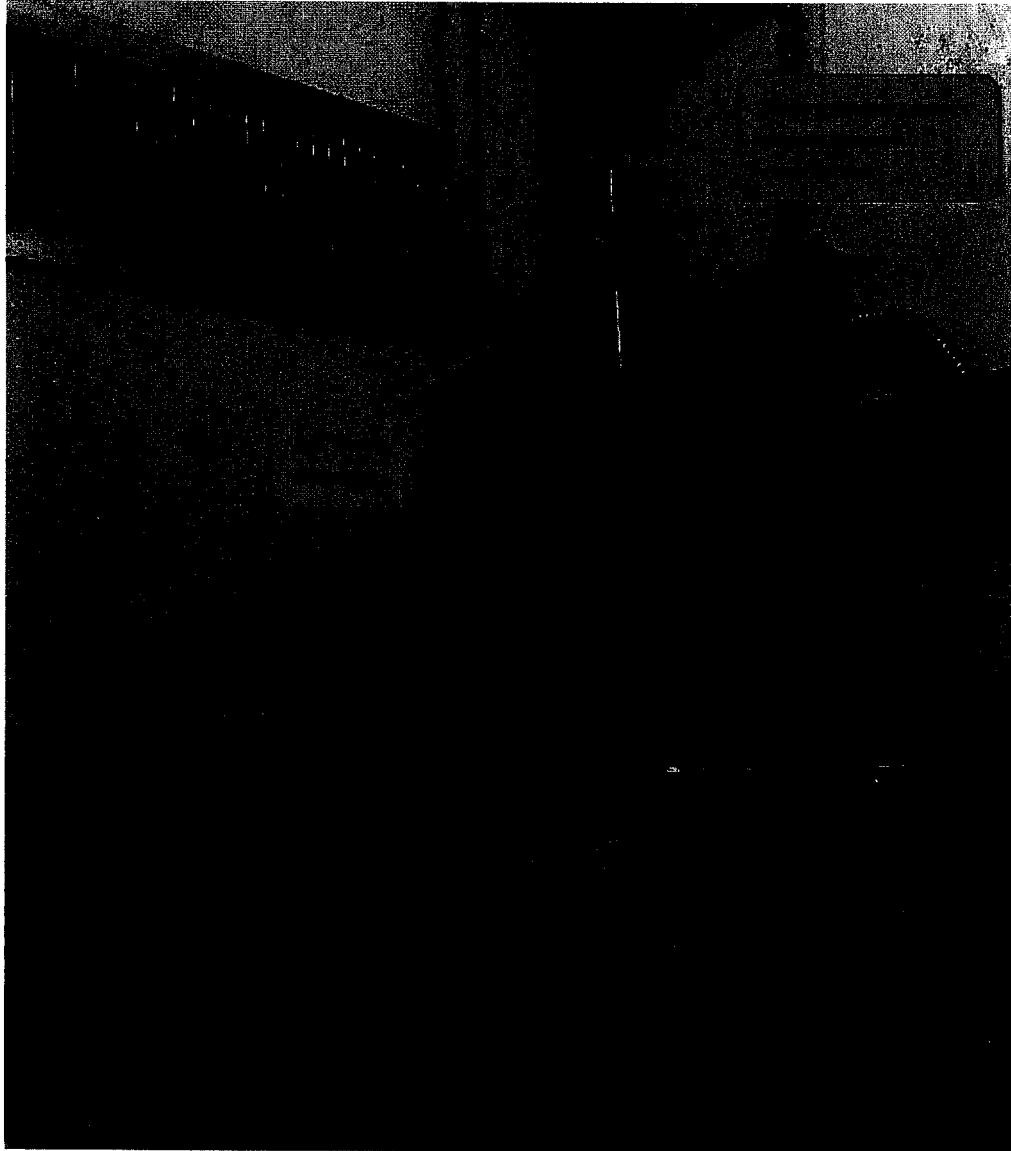


Figure 22 – Bucky Den shelter halo ground corner down runner (closest to tree near generator with conductor hanging in it from tower) with arc flash damage

38. [REDACTED] Bond all metal handrails for shelter entrance and generator to buried ground rings. This is a touch potential personnel safety issue.
39. [REDACTED] Inside shelter, cut 12 inch gap in halo ground conductor on end of shelter opposite the MGB. This eliminates a ground loop.

40. [REDACTED] Change MGB ground connection from a single #2 solid conductor to two #2 AWG stranded conductors that go to RF entry panel interior sub-panel. The RF entry port has 4 6-inch copper straps to ground. Since the shelter is raised, reducing the inductance of the MGB connection to ground will provide additional protection.



Figure 23 – Bucky Den shelter current interior RF entry port and MGB configuration

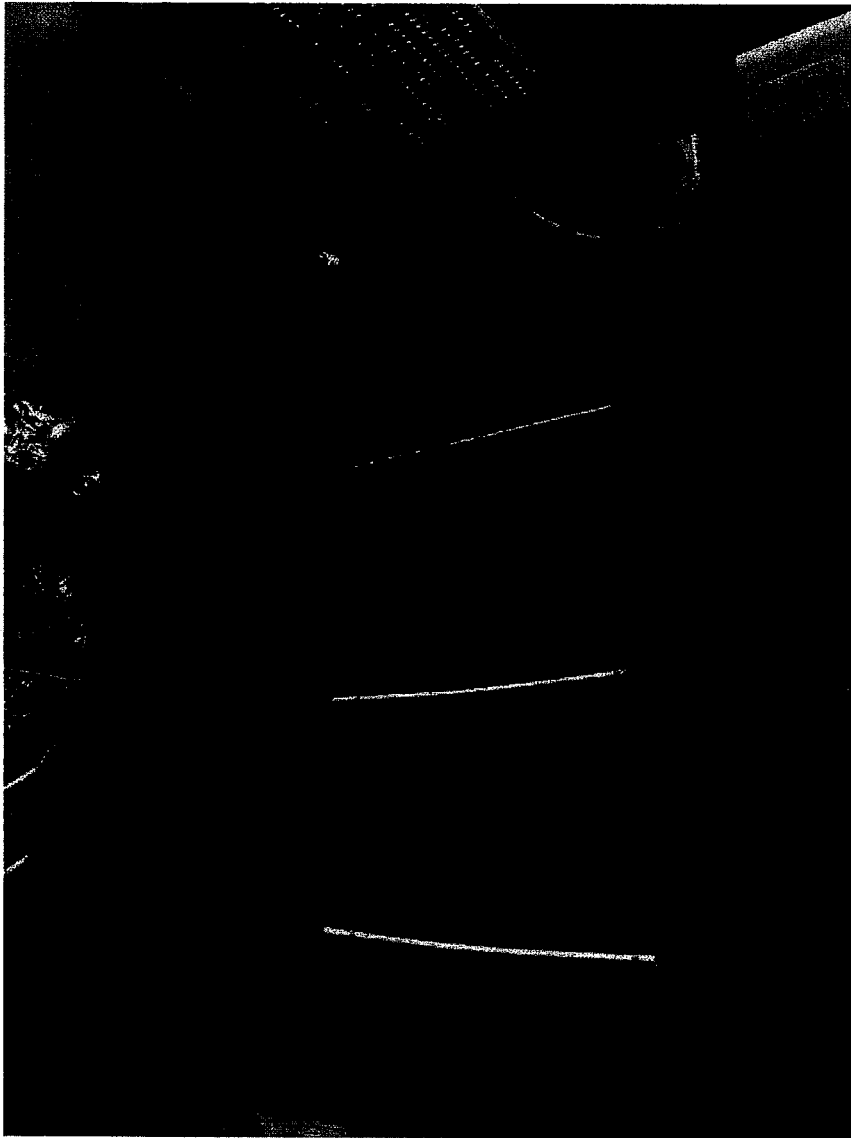


Figure 24 – Bucky Den shelter current exterior RF entry port configuration

Conclusion:

The City of Hialeah, FL grounding audit did not identify a single “smoking gun” but several potential contributing factors to the damage. The most important factor contributing to potential damage at all 3 sites is the tower grounding. In addition, at the Bucky Den site several urgent items were identified that should be addressed quickly to avoid damage from future lightning strikes.

By implementing the items in this audit, I believe the damage due to lightning surges can be drastically reduced.

Please feel free to contact me if you have questions about this report or implementation of a specific item.

-END-

City of Hialeah Grounding Responsibility Matrix based on Grounding Audit Report 9/10/18

Location: **Fire Department**

Item No	Description	Responsibility		
		Harris Original Contract	Harris Change Order	City of Hialeah
1	Improve tower leg grounding and ground ring		X	
2	Add lightning rod to top of tower		X	
3	Improve tower ground bar grounding		X	
4	Install exaggerated drip loop on new RF transmission lines	X		
5	Install ground kits every 25ft on new RF transmission lines	X		
6	Remove unused tower mounted equipment		X	
7	Bond Telco SGB directly to MGB	X		
8	Add surge protection to incoming lines	X		
9	Replace AC surge protector		X	
10	Bond new cabinets to MGB equipment home run with irreversible crimp	X		
11	Bond cable ladder to MGB only	X		
12	Ensure Alcatel microwave DC equalization correctly sized and located		X	
13	Replace interop radio ground split bolt with irreversible crimp	X		
14	Ensure dispatch center grounding referenced to MGB		X	
15	Repair copper straps and insulation between straps		X	
16	Improve 2 nd story exterior ground bar grounding		X	
17	Install RF surge protectors for new RF transmission lines at RF entry	X		
18	Move RF surge protectors for interop radios' RF transmission lines to RF entry	X		
19	Improve the ground connection between MGB and RF entry port	X		
20	Ground cable TR ground blocks to MGB	X		

Location: **Police Department**

Item No	Description	Responsibility		
		Harris Original Contract	Harris Change Order	City of Hialeah
1	Improve tower leg grounding and ground ring		X	
2	Add lightning rod to top of tower		X	
3	Improve tower ground bar grounding		X	
4	Install exaggerated drip loop on new RF transmission lines	X		
5	Install ground kits every 25ft on new RF transmission lines	X		
6	Remove unused tower mounted equipment		X	
7	Bond Telco SGB directly to MGB	X		
8	Add surge protection to incoming lines	X		
9	Replace AC surge protector		X	
10	Bond new cabinets to MGB equipment home run with irreversible crimp	X		

11	Bond cable ladder to MGB only	X		
12	Ensure Alcatel microwave DC equalization correctly sized and located		X	
13	Replace interop radio ground split bolt with irreversible crimp	X		
14	Ensure dispatch center grounding referenced to MGB		X	
21	Repair broken fence gate jumper		X	
22	Terminate generator control/alarm wires and add surge protection		X	
23	Ensure two tower ground rings bonded together		X	
24	Bond ice bridge grating sections together and to posts		X	
25	Bond shelter air conditioning unit housings		X	
26	Replace shelter MGB ground connection	X		
27	Install MGB equipment home run to second equipment row	X		
28	Add shelter AC surge protector		X	
29	Add second connection between equipment room MGB and RF entry	X		
30	Ensure no mold growing on equipment room walls			X

Location: **Bucky Dent**

Item No	Description	Responsibility		
		Harris Original Contract	Harris Change Order	City of Hialeah
1	Improve tower leg grounding and ground ring		X	
2	Add lightning rod to top of tower		X	
3	Improve tower ground bar grounding		X	
4	Install exaggerated drip loop on new RF transmission lines	X		
5	Install ground kits every 25ft on new RF transmission lines	X		
6	Remove unused tower mounted equipment		X	
7	Bond Telco SGB directly to MGB	X		
8	Add surge protection to incoming lines	X		
9	Replace AC surge protector		X	
10	Bond new cabinets to MGB equipment home run with irreversible crimp	X		
11	Bond cable ladder to MGB only	X		
12	Ensure Alcatel microwave DC equalization correctly sized and located		X	
13	Replace interop radio ground split bolt with irreversible crimp	X		
31	Remove conductor hanging off tower into tree		X	
32	Ensure incoming utility AC power properly grounded and bonded		X	
33	Ensure no neutral-ground bond located in generator		X	
34	Add ground connection to generator frame		X	
35	Remove two large trees growing inside fenced tower compound		X	
36	Ensure shelter ground ring bonded to tower ground ring		X	
37	Remove 4 shelter corner down runner connections	X		
38	Bond all metal handrails		X	
39	Cut 12-inch gap in shelter halo ground conductor	X		
40	Improve MGB ground connection	X		



EXHIBIT "A"
Section 11-A
AMENDMENT PRICING SUMMARY
Microwave Links & Core to Core
And Grounding Remediation

Pricing Summary

Harris is pleased to provide the City of Hialeah, Florida, with the following firm fixed price proposal. This offer is based upon the terms and conditions are pursuant to the Professional Service Agreement by and between the City of Hialeah and Harris executed on June 27, 2018.

Microwave Link Nokia (to Miami)			
One 11 GHz hot standby (1+1) link between the City of Hialeah FD Headquarters and the City of Miami's Fire Station 3 Location.	\$153,548.75	1	\$153,548.75
Subtotal			\$153,548.75
Core to Core Implementation Services			
	\$44,700.00	1	\$44,700.00
Subtotal			\$44,700.00
Grounding Remediation			
Bucky Dent Grounding Remediation	\$38,162.50	1	\$38,162.50
Hialeah Fire Headquarters Grounding Remediation	\$27,012.50	1	\$27,012.50
Hialeah Police Headquarters Grounding Remediation	\$30,912.50	1	\$30,912.50
Subtotal			\$96,087.50
Options Below the Line			
One 6 GHz hot standby (1+1) link between the City of Hialeah PD Headquarters and the City of Miami Beach Parkview Point location.	\$175,361.25	1	\$175,361.25
Services for conversion to standalone after being deployed as part of multi-region	\$190,560.00	1	\$190,560.00

RESOLUTION NO. 2018-135

RESOLUTION OF THE MAYOR AND CITY COUNCIL OF THE CITY OF HIALEAH, FLORIDA, REAPPOINTING **MICHAEL ROSENGAUS** TO THE BOARD OF TRUSTEES OF THE EMPLOYEES GENERAL RETIREMENT SYSTEM AS THE FRATERNAL ORDER OF POLICE, APPOINTMENT FOR A TWO (2)-YEAR TERM ENDING ON DECEMBER 31, 2020.

WHEREAS, pursuant to section 70-131 (a) there is created a board of trustees in whom is vested the general administration, management and responsibility for the proper operation of the retirement system and for making effective this article.

WHEREAS, the board of trustees shall consist of seven trustees.

WHEREAS, one trustee shall be appointed by the Mayor. This trustee shall be an elector of the city. One trustee shall be appointed by the city council. This trustee shall be an elector of the city. Four trustees shall be appointed, one from each group; management, AFSCME Local, IAFF Local, and the Fraternal Order of Police. The appointee must be an active member of the retirement system or of the deferred retirement option program (DROP). Term of office for each trustee so elected shall be for a two-year period, and the trustee shall be voted into office and elected as determined by each group.

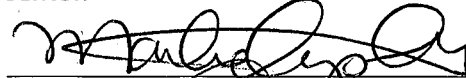
WHEREAS, The Fraternal Order of Police, nominated Michael Rosengaus as its appointment to the Board of Trustees of the City of Hialeah Employees' Retirement System.




NOW, THEREFORE, BE IT RESOLVED BY THE MAYOR AND CITY COUNCIL OF THE CITY OF HIALEAH, FLORIDA, THAT:

Section 1: Michael Rosengaus is hereby reappointed to the Board of Trustees of the Employees General Retirement System of the City of Hialeah, Florida, on behalf of the Fraternal Order of Police for the remainder of a two (2)-year term ending on December 31, 2020.

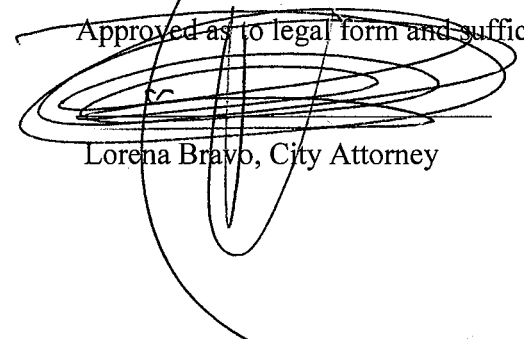
PASSED AND ADOPTED this 11 day of December, 2018.

Attest:


Marbelys Fatjo, City Clerk


Vivian Casals-Munoz
Council President
Approved on this 3 day of January, 2017 

Mayor Carlos Hernandez

Approved as to legal form and sufficiency:


Lorena Bravo, City Attorney

Resolution was adopted by a 7-0 vote with Councilmembers, Zogby, Lozano, Casals-Munoz, Garcia-Martinez, Caragol, Cuenca, Hernandez, voting "Yes."

RESOLUTION NO. 2018-136

RESOLUTION OF THE MAYOR AND CITY COUNCIL OF THE CITY OF HIALEAH, FLORIDA, REAPPOINTING **MINYING HO** TO THE BOARD OF TRUSTEES OF THE EMPLOYEES' GENERAL RETIREMENT SYSTEM OF THE CITY OF HIALEAH AS THE AMERICAN FEDERATION OF STATE, COUNTY AND MUNICIPAL EMPLOYEES ("AFSCME") APPOINTMENT FOR A TWO (2)-YEAR TERM ENDING ON DECEMBER 31, 2020.

WHEREAS, pursuant to section 70-131 (a) there is created a board of trustees in whom is vested the general administration, management and responsibility for the proper operation of the retirement system and for making effective this article.

WHEREAS, the board of trustees shall consist of seven trustees.

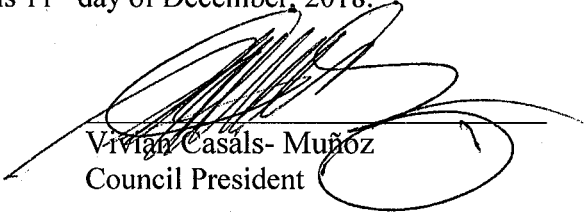
WHEREAS, one trustee shall be appointed by the Mayor. This trustee shall be an elector of the city. One trustee shall be appointed by the city council. This trustee shall be an elector of the city. Four trustees shall be appointed, one from each group; management, AFSCME Local, IAFF Local, and PBA. The appointee must be an active member of the retirement system or of the deferred retirement option program (DROP). Term of office for each trustee so elected shall be for a two-year period, and the trustee shall be voted into office and elected as determined by each group.


WHEREAS, the AFSCME, Hialeah Local 161, nominated Minying Ho as its appointment to the Board of Trustees of the City of Hialeah Employees' General Retirement System.

NOW, THEREFORE, BE IT RESOLVED BY THE MAYOR AND CITY COUNCIL OF THE CITY OF HIALEAH, FLORIDA, THAT:

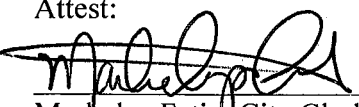
Section 1: Minying Ho is hereby reappointed to the Board of Trustees of the Employees' General Retirement System of the City of Hialeah, Florida, on behalf of American Federation of State, County, and Municipal Employees ("AFSCME") for a two (2)-year term ending on December 31, 2020.

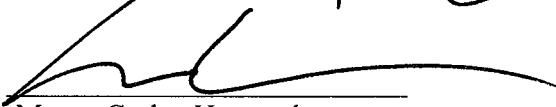
PASSED AND ADOPTED this 11th day of December, 2018.


Vivian Casals-Muñoz
Council President

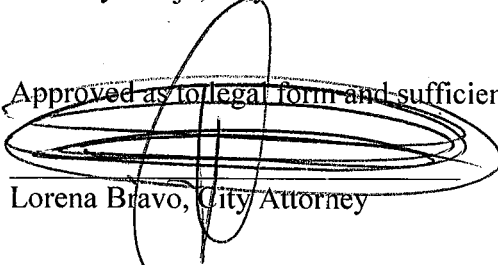
Approved on this 3 day of January, 2019. 

Attest:


Marbelys Fatjo, City Clerk


Mayor Carlos Hernandez

Approved as to legal form and sufficiency:


Lorena Bravo, City Attorney

Resolution was adopted by a 7-0 vote with Councilmembers, Zogby, Lozano, Casals-Munoz, Garcia-Martinez, Caragol, Cue-Fuente, Hernandez, voting "Yes."